China Southern: Digital Environments as Geopolitical Contact Zones

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Abstract

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This dissertation examines the role of digital media in shaping the geopolitics and materiality of environments in China over the first two decades of the twenty-first century. I look at digital discourses ("smartness," "connectivity," "data transparency"), media practices (film/video, satellite images, data capture), and infrastructures (surveillance, telecommunication) and argue that environments, such as land, sea, and air, are increasingly transformed into political territories, and engineered as part of the new technologies of social governance in the digital era. More specifically, this dissertation moves from urban smart infrastructures in Southern China (chapter one), to contested mediations of the disputed South China Sea (chapter two), and finally, to the circulation of air pollution data and imaginaries across the global South (chapter three). With ethnographic research in addition to visual and discursive analysis, my work employs a multi-scalar approach—sub-national, regional, global—to explore both the institutional and popular actors that shape these eco-digital formations. Focusing on the *South* as both a geographical and political concept, this orientation challenges the Northern-centered vocabularies and framing to global film and media studies. Meanwhile, *China Southern* reinstates the transnational momentum of the Southern question (Casarino 2010), especially situated at the juncture between neoliberal experiments since the 1990s and the rise of the "Chinese Dream" in the 2000s as a cultural discourse. In doing so, this research contributes to the broader discussion on global governance, and conceptualizes the often obscured theoretical and material entanglement of media and environments in Asia.

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Introduction

The Southern Roadmap of Digital Environments in Post-Reform China

This dissertation scrutinizes the intertwining relationship between digital media, environments, and geopolitics from the perspective of the People's Republic of China. It examines how hegemonic digital discourses – of "smartness," "connectivity," and "transparency" – have been distributed and materialized across built and natural environments in the first two decades in the twenty-first century. I propose to adopt a *southern* framework to navigate this complex digital geography conceptually and methodologically: from urban smart infrastructures in southern China, to contested mediations of the disputed South China Sea, and finally, to the circulation of air pollution data and imaginaries across the Global South. Each chapter of the dissertation adopts one geographical scale – sub-national, regional, and global – to trace the ways in which environments, such as land, sea, and air, are engineered into geopolitical contact zones for nation-states, institutions, and popular actors, or as part of the new technologies of social governance in the digital era. In what follows, I will lay out my conceptualization of digital environments, and how I engage with "the South" both as a theoretical reflection of the Southern question, and an analytical tool to jump across less-examined sites and overlooked media practices. I argue that these approaches are crucial for understanding geopolitics in the historical juncture of post-reform China, between neoliberal experiments since the 1990s and the rise of the "China Dream" in the 2000s as a political and cultural discourse.

Digital Media in the Age of the "Chinese Dream"

The recent controversy over Huawei's fifth-generation (5G) wireless network since March 2019 is a timely example of how digital environments are increasingly intertwined with geopolitics, even before the infrastructure touches the grounds. The term "digital environments" signals a complex ecology at work in this heated debate. Popular media have saturated the public with an imagination of "the horrifying potential" of 5G wireless technologies in which the discourse of digital connectivity has been closely tied to issues of national security and global surveillance (Halpern 2019). State institutions speculated that 5G networks might affect meteorological data and compromise the ability of weather forecast as it will interfere with the 24GHz frequency broadband transmission crucial to water-vapor measurements (Witze 2019). On the other hand, the scientific community voiced its caution against 5G networks' unevaluated impact on the environment, human health, and

neurological systems.[1] All of which are further bracketed under the US-China trade war, particularly affecting the transnational distribution of hardware and software, such as Google services and ARM withdrew its technical support to Huawei (*The Economist* 2019), which is reminiscent of the hegemonic global order generated through intellectual property and licensing.[2]

This connection between digital technologies and geopolitics is certainly not new. One may recall the post-war space race, during which the development of satellite technologies became a battle ground for cold-war geopolitics between the communist and capitalist blocks. Today, this history has left its footprints on the geography of national satellite communication and broadcasting (Parks 2012; Price 1999). One can also think of the undersea fiber-optic cables which currently sustain the majority of our trans-oceanic digital communications. These largely invisible cables hold a historical connection to telegraph networks from colonial periods, and are caught in the complex coastal politics of their landing sites in the Pacific Islands, and the corporate interests to centralize global networks (Starosielski 2015). These historical examples reveal how the politics of digital technologies are embedded within their social and natural environments rather than separated from them.

Nevertheless, the 5G wireless network controversy signals a new dynamic at play. For the first time, China is playing a significant role in shaping global digital politics, not simply as a tech manufacturer or content provider, but through positing itself as a leading network developer. This fact itself needs to be carefully examined rather than celebrated, especially given how much of the current debate across global media coverage is routinely framed under the polarized tension between the United States and China. Perhaps the revival of this cold-war imaginary in the digital debate is unsurprising. As cultural studies scholars and post-colonial scholars continue to remind us, the cold-war mentality has never entirely disappeared, and finds its afterlife in circumscribing the way we understand modernity, globalization, and certainly digitality.

However, this dissertation is not about China's global expansion of 5G networks and its current political consequences. Instead, it focuses on earlier efforts and experiments in the People's Republic of China that have paved the way for the contemporary moment, when

[1] The 5G Appeal was initially submitted to the European commission in 2017, As of May 16, 2019, 235 scientists and doctors have signed the appeal. See its official webpage https://www.5gappeal.eu/ and reports here: https://www.jrseco.com/european-union-5g-appeal-scientists-warn-of-potential-serious-health-effects-of-5g/

[2] See works particularly addressing the global hegemony of intellectual property, as Pang Laikwan's *Creativity and Its Discontents: China's Creative Industries and Intellectual Property Rights Offenses* (2012)

digital environments have become crucial geopolitical sites. Throughout the three chapters, I investigate the role of digital media in shaping the materiality and geopolitics of both built and natural environments in the first two decades of the twenty-first century. During these two decades, when China developed at full speed after the economic reform in the 1980s, digital media became less reflective of the country's rapid social transformation and its effects on everyday life, to being an essential part of political governance. In other words, "the political" is contingent upon a complex media ecology and constitute what I call "digital environments": digital discourses, policies, public imagination, hardware and software, media infrastructure, social relations, natural resources, and even fears and aspiration. I argue that these dimensions are no longer used separately as "tools" of governing, but they work together to reconfigure our lived environments into political territories. For example, in Chapter Three, I discuss China's "war on smog," as one example of how air has become "a site and the subject of governance" (Nieuwenhuis 2016). Yet the governing of and through air relies heavily on an assemblage of policy-making, cultural production of images and data visualization, and infrastructures that unevenly distribute environmental risks, resources, and affects.

This dissertation does not solely focus on the big players such as the state and tech companies like Huawei. In fact, the 5G controversy clearly indicates how often the connection between digital environments and geopolitics seems to only work at the scale of the global-national. The Chinese Dream, as I will discuss below, is a strong example of how such a connection rises both as a political imperative at the level of the nation-state, but also as a cultural discourse targeting the popular. As such, a challenge of this project is to address both the functioning of macro-narratives at the material levels of production and consumption, while accounting for what Anita Say Chan (2013) calls "micro narratives and situated stories," those outside of a digital future that is predetermined by innovation labs, transnational tech companies, intellectual property laws, and the nation states.[3]

[3] She argues these macro-narrative of digital futures conjure up a specific notion of the peripheries as "mere agent[s] of global counterfeit," simply capable of copying and reproducing a future that is always already there. Her insistence on "micro-ness" in this regard speaks less to scale or ambition than it does of experiences that "cannot be accounted for by existing discourse on digital culture." Anita Say Chan, *Networking the Peripheries: Technological Futures and the Myth of Digital Universalism* (Cambridge and London: The MIT Press, 2013), x-xi.

Figure 1. Public billboards in Shenzhen, branding the "Chinese Dream" as the Shenzhen dream. Photo by author.

This codependent formation of digital environments and geopolitics took shape in the country's transition to the era of the Chinese Dream. The term "Chinese Dream" was introduced in 2012 in a speech by China's president Xi Jinping. The term quickly became a cultural buzzword as it both evokes the historical struggle of China's development, and points to a new vision that drives all aspects of social life. In less than a decade, this term evolved into a full-fledged ideological formation, and became "arguably another globally hegemonic discourse" (Yang 2016, 177). However, while I agree with Yang's point that the Chinese Dream relies on a national imaginary similar to earlier branding practices such as "Made-in-China" and "Create-in-China," this dissertation sees the Chinese Dream as a much more aggressive political formation that transformed social and natural environments at various scales (Keane 2007). In contrast to its benevolent tone as a national aspiration, the Chinese Dream has forcefully transformed and integrated into China's urban landscape and architecture: public billboards are now centrally produced and promote the core values of the Chinese Dream in every city, the "beautification" of urban streets take over local neighborhoods, and evict thousands of migrant workers out of the urban centers, where only certain part of the population are allowed to "dream." More controversially, the Chinese

Dream continues to drive mega development projects around the world. The Belt and Road Initiative, for example, has instigated various infrastructural projects across Asia, Africa, and Europe. These projects have been criticized for exploiting undeveloped territories (rural residential areas across Southeast Asia) at the expense of local economies, causing a global hike in national debts. Others have warned that the development projects are essentially a political strategy that will allow China to control critical choke points and resource access both on land and sea. It is beyond this dissertation's scope to expand on these immediate and on-going environmental and political consequences. Yet by positioning my analysis in this critical moment of the Chinese Dream, I emphasize the urgency to identify and assess they ways digital environments are always in formation within these geopolitical tensions and histories.

Rather than suggesting an overlapping relation, I adopt the term "contact zone" to signal the ways digital technologies, environments, and geopolitics encounter each other under various power relations and political interests. As Rossen Djagalov and Masha Salazkina (2016, 280) argue, contact zones cannot be easily reduced to any singular hegemonic models and power relations, in particular cold-war binaries such as capitalist/(post-)socialist, center/periphery, and most pertinent to my project state/popular, control/freedom. Therefore, "contact zone" hopes to encapsulate the complexity of how the production of digital discourses, material infrastructures, and their situated practices in various environments instigate geopolitical imaginations from the perspective of China. At the same time, these imaginations are further enacted in real-life political tensions and struggles.

Media and/as Environments

My emphasis on geopolitically-grounded digital practices takes shape by rethinking the critical intersection between media and environments, an intellectual field that predominately arose out of Anglo-American Film and Media Studies scholarship in the past two decades. Ecocriticism, first expressed in literary theory, significantly impacted the early conception of "eco-media," which argues that film and media have always been environmental. Eco-media scholars like Matthew Fuller (2005), Richard Maxwell and Toby Miller (2012), and Sean Cubitt (2016) have recognized that media, society, and the environment are "inextricably entangled together, both in how media texts represent the environment and in the inevitable ways that media texts and systems are materially embedded in natural resource use and abuse" (Rust et al. 2016, 2). In other words, media environments exceed a focus on representation of climate change, and extend to the lived environments through which media

circulate, the ecological footprints they generate, and the ways in which environments constitute media storage, processing, and communication themselves. Other scholars have taken this entanglement even further, and note that twenty-first-century media are more atmospheric and elemental than twentieth-century media (Hansen 2015), or rather, that elements have always been a crucial part of our understanding of media (Peters 2015).

Even though these scholars open a conceptual space to think about the ways in which (digital) media constantly engage with and rely upon natural environments and resources, my interest lies in exploring how digital media (including discourses, imaginations, and material infrastructures) co-constitutes natural, social, and political environments. This is very much indebted to a conceptual shift proposed by Jennifer Gabrys (2016), and a turn to media's materiality through the works of Lisa Parks (2015), Brian Larkin (2008), Nicole Starosielski (2015), and Nikhil Anand (2017). Conceptually, Jennifer Gabrys (2016) makes a crucial distinction between environments as the backdrop on which media functions and what she calls "becoming environmental": where digital media become constitutive to their very environment, and shape subject formations within it. Throughout my dissertation, I argue that co-constitutive media environments must be understood as inseparable from geopolitical imaginaries. Centrally, I agree that "environments" cannot be understood simply as a world of media contents but to "encompass the social, architectural, and natural ecologies" (Starosielski 2016, 21) through which information circulates, infrastructure surfaces, and geopolitical tensions are reconfigured. At the heart of my expanded geography of digital environment lies two sides. On the one hand, I pay close attention to the operations of space and territorial politics when the planetary becomes the dominant spatial imaginary of the digital. This is most apparent in the smartness mandate discussed in Chapter One, and in the the South China Sea dispute in Chapter Two. On the other hand, the formation of digital environments is always in fluctuation. What have taken for granted as "natural" environments are undergoing tremendous transformations in the rapid expansion of digital technologies. The atmosphere is a daunting example of how digital sensors, monitoring devices, data visualizations become part of the air environment and our experience of it.

Figure 2. Air quality monitoring station in Beijing. Source: Tencent Photos

While these various interpretations of the relationship between media and environment have been foundational to my work, much of the scholarship often lacks conceptual rigor when addressing non-Western contexts and complex geopolitical territories. Yuriko Furuhata (2017) offers a strong exception here, and argues that the presupposed connection between media and its environmental register is very much a historical construct. By tracing Japanese architectural discourses in the 1960s, she illustrates how "specific economic, political, and epistemic conditions" of the time contributed to the current environmental understanding of media (Furuhata 2017, 54). The western-bias results in historical amnesia. This oversight is not only present in the conceptual connection between media and environments, but also reflected in the inattention to the violent geography of resource extraction. Macarena Gomez-Barris points out that in "the extractive zone," the colonial legacy works closely with extractive capitalism in shaping the natural and social environments of South America. As she notes, "If colonial seeing first appeared as administrative rule over people and land, then in the digital phase, extractive states currently dispossess through new technologies" (Gomez-Barris 2017, 26). I certainly share this critique that our contemporary debates on (digital) media environments need to engage more vigorously with the historical contexts and geopolitical dynamics beyond the Anglo-centric framework. More importantly, this dissertation also argues that these digital formations have a direct impact on the current political landscape, by actively reconfiguring notions such as

urbanism, ocean sovereignty, and data governance.

With this in mind, this dissertation draws a critical line from land, sea, to air, each focusing on one sets of dynamics. In Chapter One, I look at Shenzhen's history of urban reform, which is crucial to how smart city becomes operational on the ground, and I argue that the discourse of smartness directly influences the urban landscape and its populations. If Chapter One is about how digital media "lands," then Chapter Two explains how land continues to dominate digital imaginaries and infrastructures in the South China Sea. However, I argue that the shifting boundaries between land and sea has reconfigure what constitutes political authority and legitimacy in the disputed region. Lastly, Chapter Three pushes beyond the scope of immediate territories of land and sea, and to rethink the Global South as an atmospheric formation, one that is shaped by the trans-boundary movement and imagination of air pollution. As such, this move from land, to sea, and finally air hopes to invoke a different kind of geopolitics, "that is not reductive to a thingness, associations of physical properties of objects in assemblages" but instead account for more nuanced movements and connections of the world (Adey 2015, 69).

China Southern

To understand the complexity outlined above, I propose to take a *southern* framework to unpack how digital media, environments and geopolitics are interwoven. This southern framework both recognizes and challenges a Northern-centered epistemology of techno-modernity. Media practices in countries like China are dominated by certain vocabularies and discourses of the digital—like innovation, smart economy, open-access networks, data transparency—that take shape in Silicon Valley, among other northern metropolises. For example, the documentary produced by *Wired magazine* in 2016 directly branded Shenzhen as "The Silicon Valley of Hardware." The Yabacon Valley in the suburb of Lagos, Nigeria, dreams to put Africa into the global map of tech innovation and start-up incubators. Despite their different narratives, these stories both use Silicon Valley as the central reference point. As a result, emerging global digital sites can either copy the Western model or are constantly branded as copycats and fakes, if not depicted as outright illegal or backward in comparison.[4]

Therefore, the first part of my dissertation title, "China Southern," functions as first a scaffolding to connect research sites and media practices that are often occluded by

[4] This narrative of China's relationship with the counterfeit cultures, for example, Fan Yang, *Faked in China: Nation Branding, Counterfeit Culture and Globalization* (2016); Joshua Neves, *Faking Globalization: Beijing's Media Urbanism and the Chimera of Legitimacy* (forthcoming).

hegemonic epistemologies, which prioritize certain geographical routes and notions of digital modernity. Geographically and conceptually speaking, this project moves from Southern China to the South Pacific Ocean and then to the Global South. Respectively, each chapter takes up one scale—subnational, regional, and global—to investigate how digital discourses, such as smartness, connectivity, and data transparency, shape the geopolitics and materiality of urban lands, disputed ocean, and polluted atmospheres. Furthermore, "China Southern" also signals a conceptual engagement with previous theoretical debates on the "Southern question." I extend these theoretical debates to examine how southern meanings and knowledge may be re-interpreted and produced, particularly in Chinese (Film and) Media Studies. I will further elaborate this conceptual aspect later in this introduction.

"China Southern," takes initial inspiration from Leo Ching's essay "Empire's Afterlife: The 'South' of Japan and Asian Heroes in Popular Culture" (2011). In it, he defines the "South" as a way of thinking rather than an entity with concrete geographical or territorial limits. The South, therefore, becomes a useful method for him to analyze how the representation of Asian heroes in popular culture legitimizes and extends postwar Japan's imperial power and imagination over Southeast Asia (Ching, 2011: 86). Ching's argument influences the conceptual formation of China Southern as a framework. First, a southern perspective signals a shift of focus from dominant paths of knowledge production to previously weakly-connected locales and media forms. In this sense, China *Southern* constantly reflects upon where digital practices happen outside of the well-researched sites such as Beijing and Shanghai, and what form they take shape. Second, Ching highlights that a southern trajectory could be enacted through popular media, often circulated outside of formal distribution networks. This pushes me to rethink the kind of social and political work popular media does in its global circulation, often characterized as informal and sporadic. Nevertheless, I depart from Ching's approach in one crucial aspect: digital media and geopolitics are not only connected through cultural representations and the imaginaries enacted by them, but they also require an attentiveness to their material imprints that have physically changed the environments in the South, whether through the renewal of urban neighborhoods, the construction of artificial islands in the disputed South China Sea, or the creation of a toxic breathing environment across the global South, as each of my chapter will discuss.

Adopting the southern framework is both a practical and a political choice. This dissertation starts with my experience, observation, and practices in southern China. As a sub-region away from the Northern political centers, historical and cultural formation in

southern China has shown its affinity further South: with Hong Kong, the South Pacific Ocean, Southeast Asia, and the Global South. This southern imagination already exists in literature, food cultures, but arguably in less explored fields like media studies, up until now.[5] My choice is also political because the southern framework resonates with Kuan-Hsing Chen's (2010) critique of the Cold War imaginary that persistently situates cultural practices in Asia under a polarized dyads—East/West, colonized/colonizer, consumer/producer. Once again, the 5G network controversy comes to mind and illustrates a revival of a bipolar, binary imagination between digital natives/information have-nots: Intellectual property owners/copycats; US/China. Digital environments are much more complex than these binaries can contain. In contrast, North and South signals much more checkered economics, political and cultural geographies, and imaginaries. Annette Trefzer et al. (2014) argue that, if detached from strict geographic associations, the "South" becomes "a marker for power compromised by political and economic disenfranchisement and distributed unequally via the hierarchies of gender, race, and class, then we can find the "South" in many places." In this sense, "China Southern" also pieces together a southern digital landscape that is not geographical but the product of an uneven distribution of power and "economies of abandonment" (Povinelli 2011). Certainly, this is a much larger intellectual project than what one dissertation could achieve, and my perspective is strongly influenced by own personal position in Southern China, from the Chinese perspective. Yet, I see this work as the starting point to not only identify the less-examined southern trajectory of Chinese media culture, but also explore what Joshua Neves and Bhaskar Sarkar (2017) call "the southern vitalities" of global media that are too often dismissed in existing media epistemologies.

Theorizing the Southern Perspective: "The South Must Reinvent Itself"

By the end of the twentieth century, Arjun Appadurai (1990) asks provocatively: "how does the world look – as a congeries of areas – from *other* locations?" This dissertation in some ways responds to this question and aim to continue the "southern question" as an intellectual project today. More precisely, I ask what it means to take "the South" as an "other" cultural and geopolitical vantage point, particularly for exploring different formations of digital environments. To answer this question, in what follows, I will first trace various

[5] For example, Brian Bernard (2015) discusses how the literary imagination of "nanyang" (the South Sea), particularly in between the 1850s to the 1940s, is one crucial example that connects China and Southeast Asia in their checkered history and cultural exchanges. This connection was most noticeably picked up by film scholars who discusses the Shaw Brothers film empire that moves from Hong Kong to Southeast Asia during war time.

articulations of "the South" at distinct historical moments. The constructed line from Gramsci's Southern Italy to Southern China is less a geographical journey than the encapsulation of what Cesare Casarino (2010) calls the "common potential" across various southern terrains. In the next section, I will connect these theoretical debates more specifically to existing scholarship of Chinese Film and Media Studies, to see how the southern questions could be reconfigured at the historical juncture between the development of neoliberal experiments since the 1990s and the rise of "China Dream" as a cultural discourse in the late 2000s.

In "The Southern Question," Antonio Gramsci ([1926] 1992, 13) insists on defining "the South" as "a great social disintegration that is marred by intense social inequality." Written as a reflection on post-revolutionary Italy, Gramsci repels the idealized reconciliation of the historical conflicts and inequalities between the industrial Northern Italy and the underdeveloped South. Rather, he proclaims that in Southern Italy, it is the peasants that constitute the majority of the population, who are incapable to represent and speak for themselves as a political collective. As Gramsci (13-14) argues, "The peasants have no cohesion among themselves…as a mass, they are incapable of giving a centralized expression to their aspirations and needs." Therefore, the South must be represented and mediated by others in national politics (in this case, the Southern intellectuals). This deep dependency and unevenness between North and South, and its subsequent hegemonic power relations, occupies the center of Gramsci's Southern question.

Gramsci's regional specificity or its "historical-concrete descriptiveness" has been considered both a strength and limitation for his articulation of "the South" (Morley and Chen 1996, 414). Stuart Hall, for example, warns us against careless generalization of Gramscian concepts; in this case, a caution against our contemporary fast adaptation of "the South" on a global scale. He is also against the tendency to interpret Gramsci's theories exclusively within Western Marxist traditions and thereby only applicable to Western industrial centers. The North/South division, in Hall's reintepretation, does not only work along the line of class relations, but also is "compounded by the crosscutting relations of regional, cultural, and national difference" (Ibid., 146). The British branch of Cultural Studies follows and inherits Hall's attentiveness to specificity in the work of the Southern project, its articulation of culture and politics, and advocates a critical engagement with Gramscian concepts to think through other social, and subcultural formations.

Echoing Hall, Cesare Casarino (2010, 683) also asserts that it is reductive to restrict Gramsci's Southern question exclusively to Southern Italy, since the southern question can

only make sense in transnational terms. Casarino's transnationalism draws from post-colonial theories from Frantz Fanon, Edward Said, and in particular through a re-reading of Pier Paolo Pasolini's poetry. He writes, "Pasolini's admittedly problematic disregard for national and cultural specificities, geopolitical particularities, as well as historical accuracy...ought to be understood as an attempt to produce a genuinely transnational universalism based on common potentials and common projects as opposed to those universalisms that find their stable ground in shared and essential identities" (Casarino 2010, 682).

Certainly, we should not dismiss the danger of indulging "the South" as another universalizing narrative, yet this crucial notion of the southern imaginary as not based on an essentialist cultural and national identity but built more importantly upon common potentials is what makes the southern question still relevant in contemporary times. Although Casarino never fully develops what such common potentialities are and how we shall use them productively, this is a task future scholars must take up as the South extends across various disciplines and new geopolitical conditions.

Arif Dirlik provides a concise historical mapping of the drastic shifts of meaning of "the South" as a political and critical category within global North-South relations. Being a political category that embodies a libertarian promise and perceived as "a way out of capitalism" during the decolonization movement in the late 1970s, "the South" has turned from "a possible savior of the world to an object of compassion that must be saved in order for the world to save itself" (Dirlik 2007, 14). This drastic shift of the connotation of "the South" most importantly signals a further uneven economic development at a global scale. With a structural uneven development, the South and the North are folded within each other, a spatial reconfiguration under the influence of global capital and shifting geopolitical agenda. This new North/South geography, however, is yet to respond to Casarino's call for the South as a common project that can now be found everywhere, but in various forms of cultural production and sociality.

As we witness the internationalization of cultural studies outside of Western centers, in this case Asia since the 1990s, these questions remain central but take on new variations. For Kuan-Hsing Chen (1998, 3), cultural studies is a "decolonization movement which attempts to disarticulate the colonialist and imperialist cultural imaginaries." One of the central tasks for cultural studies in Asia is to provide an ideological critique that identifies the undercurrents and emergence of the residual imperialist desire and relations, that is, what he calls *de-imperialization*. It is worth spending a moment to unpack Chen's notion of de-imperialization as a critique to both economic triumphalism and knowledge production in

Asia, crucial to the southern project. In *Asia as Method* (2010), he takes Taiwan's southward advances, a state project launched in 1994, as a key example of how the promising narrative of going "south" (Southeast Asian countries) for business opportunities is constructed as against going to Mainland China, an incentive towards the north and the center. What is at stake here, Chen argues, is the underlying structure, taking the "the South" as "a projection of the same expansionist ambitions" that are embedded in Taiwan's colonial history (Chen 2010). In fact, the economic southward marching already started since the 1980s, and what Taiwan witnessed in the 1990s is a close alliance between the state and capital, which magnified these ambitions.

Looking across Asia in the same period, it is not surprising to see a similar entwinement between imperial desires for economic expansion with a geographically bounded, yet equally fictional "South": from Deng Xiaoping's Southern Speech, the development of special economic zones in Southern China, and the rise of the Asian Tigers, to list a few examples. Southern China, similarly to South East Asia in the "southward" discourse in Taiwan, continued to embody the naïve magical solution that Gramsci would have criticized. Since the 1990s, the "magic" narrative of Southern China, along with its received state support, has lured regional and overseas capital, resources, and talents that have been considered crucial to the process of "globalizing" the South for the past two decades (Ong 2006). The goal of globalization is to magnify this "southward" process on an unprecedented scale.

Chen's invocation of an inter-Asia reference point—channeling various historical and cultural experiences across Asia and building new dialogues—thus embodies a dual criticism of post-colonial studies. Post-colonial studies' obsession with critiquing the West continues to reinforce an East/West, colonizer/colonized framework, whereas globalization seems to be surprisingly myopic to its imperial and colonial past. Thus, a strategic relocation to Asia aims to extend the discussion of de-imperialization, as well as "put colonial history back into globalization studies" in order to forge new forms of knowledge production (Chen 2010, 2). The narrative of globalizing "the South" (which here limitedly refers to the economical triumphalism given to the geographical southern Asia) animated Chen's critique of a myopic globalization as one that in fact obscures the unbalanced power structures and their historical discrepancies across Asia.

Similar to Chen, Carolyn Cartier argues that the process of globalizing the South posits an urgent question of knowledge production in and of China. In *Globalizing South China* (2001), she notes that "the South" has always been a discursively constructed notion and geographically imprecise across Chinese history. Thereby, "the South" seems to designate a

destabilizing power to a normative political and social order across various historical moments. As she argues, "From historic perceptions about the natural environments to concerns about bodily conduct and alternative life practices, the historic "South" in China emerges less as a defined place than as a process – of mobility, experience and coming into difference" (Cartier 2001, 31). Her intention is to open up "a cosmopolitan knowledge of the region" that recognizes the historical processes of regional formations (Cartier 2001, x). For her, *globalizing* South China is therefore at once a cosmopolitan knowledge of how China perceives itself and how regional meaning is created and reconfigured.

This brief overview of theoretical engagement with the southern question from political theory, cultural studies, and cultural geography is certainly far from complete. But it uncovers some of the many intellectual efforts to engage the Southern potentiality in our contemporary time. My purpose here is to argue that *China Southern* in part carries Casarino's provocation on the transnational potential of the Southern imaginaries to bring together distanced locales and cultural experiences. But as I situate my dissertation within Asian knowledge production, I divert from previous debates that focus on an economic expansionism. Instead, I point to an emerging southern political formation, contingent upon its digital environments. If, as Dirlik (2017, 15) asserts, the South now "must reinvent itself and acquire visibility on the global scene in an assertion of its autonomy," what would such a reinvention look like in relation to (Film and) Media Studies? In the next part, I will outline its implication for studies of Chinese digital environments, which rethink how existing scholarship engage with Southern politics in different registers and its influences on this dissertation.

Retracing Chinese Film and Media Studies

At the 2003 Venice Biennale, curator Hou Hanru put forward a group exhibition featuring contemporary artists from Guangdong, entitled *Canton Express*. In contrast to "Guangdong"—a provincial title set by national administration purposes, *Canton* designates a subnational space marked by its historical complexity, linguistic, and ethnic hybridity. Moreover, as part of a regional art movement, this exhibition asked how curators and scholars could address the particularities of Cantonese experiences. These experiences are often overlooked by the fact that the Chinese contemporary art scene is dominated by artists from Beijing and Hangzhou, and increasingly relying on the global art market through key cities and institutions based on the global North. Lastly, *Canton Express* not only expresses an aspiration to go global (as the exhibition brings the artwork to Venice), but also describes the actual mobility of Southern artists, who move to Northern China and abroad for better

opportunities. Following Hou's call for the southern specificity of China's contemporary art movement, the Cantonese artists Gaojie Pan (2016) ask provocatively: Where should *Canton Express* go?

Through southern experiences and perspectives, Hou's *Canton Express* theorizes China's globalization, and thereby draws attentions to southern China's geopolitical tension not only with northern China (as the center for Chinese Contemporary Art) but also with the Global North (represented by global capital and art institutions). This dissertation does in part argue that studies of Chinese digital media are similarly restrained by this Northern-centric framing, and consequently practices from Southern China are often overlooked or must re-route through a different "North" to become visible, to be global. For example, Winnie Wong (2013) discusses Shenzhen's Dafen oil painting village as a cultural phenomenon grounded in the city's urban history. At the same time, the villagers' success in creating a mode of counterfeit cultural production only seems to consolidate the narrative of "faked in China." Nevertheless, despite the highly transnational dynamics behind this geographically southern phenomenon, it becomes "visible" through counterfeiting paintings by Western master artists such as Van Gogh, or by reframing it as a celebration of migrant labor and creativity-from-below, as presented in Shenzhen's Pavilion at the Shanghai Expo in 2010.

However, as I have laid out in previous sections, I am more interested in how the South moves beyond a geographical marker and more broadly signals media forms, practices, and knowledge production that are dismissed because they often exist in informal, everyday circulations, outside of clearly defined legal frameworks, or tactically overlooked by the dominant cultural power. One way to address this shifting register of "south" between geopolitical tensions to knowledge production in this dissertation might be the discussion of video practices. Videos produce a sub-theme across the three chapters, and in each digital environment, video practices can be encouraged or disregarded so as to serve different social and political purposes.

The previous reflections of the southern framework in political theory are therefore crucial to reassess the significance of previous scholarship in Chinese Film and Media Studies, which opens a wide range of southern reinterpretations of coloniality, ethnicity, and post-socialism. In her book *Remaking Chinese Cinema: Through the Prism of Shanghai, Hong Kong and Hollywood*, Wang Yiman (2013) argues that the issue of coloniality in history of Chinese cinema not only remained unclarified but also quickly lost its critical power within the field of cinema studies. The former problem goes along with a broader debate on China's semi-colonial status. She identifies this problem in the shifting analytical

framework of urban (cinema) culture, from "semi-colonialism" to vernacular modernism, and later to post-socialist politics. These revisionist approaches risk to elide the dynamics and power struggles within the global structures of coloniality and neocolonialism, which in her opinion are still at work in understanding and shaping film and media cultures in Asia. According to Wang, within this historical argument for the influence of colonial power relations, trans-pacific filmmaking and circulation across Shanghai, Hong Kong, and Hollywood exemplify "the underlying compulsion of repetition driven by the desire for reinvention and reconfiguration" of the self-Other, center-Periphery relationship (2013, 3). This critical reinvention of the binary relations emerge particularly through re-examining southern Chinese cinema's cross-border practices: from multi-lingual (Cantonese/Mandarin), to hybrid genres (Cantonese opera films and Hollywood fantasy genre), and transnational production of the "Chinese elements."

The attention to Chinese non-fiction film culture since the 1990s, in particular the Chinese independent film movement and Digital Video cultures, points to another reinvention of the "South." Crucial works such as Lv Xinyu's *New Documentary Movement,* Zhang Yingjin and Paul G. Pickowicz's edited collection *From Underground to Independent: Alternative Film Culture in Contemporary China,* and Chris Berry, Lv Xinyu and Lisa Rofel's edited collection *New Chinese documentary Film Movement: For the Public Record* (2010), carve out an alternative framing of Chinese film and media culture from the 1990s to the early 2000s. This alternative public culture accounts for a growing political and social engagement in non-fiction films, which also establishes a formal association with amateurism, low-budget DV culture, and on the spot realism (jishi zhuyi). Zhang Zhen and Angela Zito's edited collection *DV-made China: Digital Subjects and Social Transformations after Independent Film* brought to light a highly disintegrated landscape of media communities and experiences through digital video practices. As Zhang and Zito (2015, 7) describe, "this fast-evolving DV culture has facilitated the making of a "DV China" comprising various film and media communities across different social strata, and "alternative archives" for disenfranchised groups, including ethnic and religious minorities and LGBTQ communities." Putting pressure on various social strata and "disenfranchised groups," they foreground the significance of social and media formations prompted by ethnicity, religion, and sexuality: dynamics that fall out of dominant registers such as class and nation-states, among others. Furthermore, this "alternative" framing cannot be hastily equated as a resistance to the dominant power, but simply grows alongside as something additional, claiming that "this interpretation captures the way in which alternativeness can

produce significant change but not through the route of direct opposition" (Berry et al. 2010, 137). This reading of alternativeness, remains crucial to thinking about "southernness" as a common potentiality. When the North and South have become more entangled than ever before, the South has long lost its status as "a way out of capitalism," but rather grows alongside and even within capitalism.

Furthermore, the southern debates both engage with and complicate the socialist/post-socialist paradigm that has been discussed by numerous scholars. Here I comparatively look at two distinct ways of approaching the post-socialist debate by media scholars. Wanning Sun and Jenny Chio, for example, present a provincial mapping of Chinese media in contrast to a hierarchical structuring that is consistently centered around "the national" while conflating the provincial all together (2012). For Sun and Chio, the post-socialist project is closely tied to post-colonial scholar Dipesh Chakrabarty's notion of "provincializing" (2007), more specifically as a spatial turn to account for various sub-national levels, and the regionalization and localization of media production and consumption. While provincial TV channels such as Hunan channel have created a regional model of content development in reality shows and star-driven TV dramas, southwestern Chinese provinces such as Guizhou remain the largest media producers of ethnic cultural contents and distribute through informal channels such as DVDs (Chio 2017). Tan Jia (2014, 198) further uses the *province* to think beyond "the constraints of cultural dominance versus cultural resistance" through the case of Cantonese digital activism and popular rap culture. Rather than provincializing the national, she suggests to "centralizes a province" in order to interrogate how digital technologies created new cultural affordances for specific communities.

Olivia Khoo and Sean Metzger, however, put pressure on the temporal dimension in their collection *Futures of Chinese Cinema* (2009), wherein the post-socialist turn constitutes one of the many temporalities of the "future" being conjured in film and media culture. Chris Berry's essay in this collection argues that Jia Zhangke's films present a temporality of "in-the-now (and then)", one that acknowledges China's rapid historical and cultural change. Drawing from Jia's cinematic worlds, Berry (2009, 115) continues that here "post-socialism" does not signal a break from socialism, but rather, "a loss of faith and reflection on the grand narrative posed by socialism" While the understanding of "in-the-now" definitely owes its credit to Frederick Jameson's account for postmodernism as "a falling away of realism and its replacement with nostalgic pastiche and spectacle." Berry (115) insists that in post-socialist China, realism did not fall away but continued in various forms, constituting the part and parcel of an ordinary, everyday experience of history, even in the post-socialist world.

These previous scholarship illustrate a search for the "South" in Chinese Film and Media Studies: some engaging with the discipline's geographical biases, some targeting the theoretical potential to move beyond a center-periphery, state-popular model, and instead foregrounding ethnicity, sexuality, and linguistic complexity in play in a southern media environment. This dissertation follows this critical impetus throughout its three chapters.

Chapter breakdown and methods

This dissertation uses the southern framework as an overall scaffolding for the constitutive relationship of digital media, environments, and geopolitics, in particular from the perspective of People's Republic of China. It is divided into three chapters, each of them engaging with one iteration of the south—southern China, the South China Sea, and the Global South—to outline how digital discourses and infrastructure shape the environments of land, sea, and air, and how these digitalized environments constitute part of the changing geopolitical relations.

While the chapters build their foundation through discourse analysis and close visual analysis, this dissertation's main methodological challenge lies in what constitutes ethnography to digital media. Each chapter posits a different answer. Chapter One highlights the importance of on-site fieldwork and what Gabriella Coleman (2010) calls "the prosaic of digital media" - thinking through how digital media narratives feed into urban infrastructures and cultural branding. During my research trips to Shenzhen, I combine various methods: photographing the urban infrastructures, video recording my encounter with the urban spaces, collecting printed materials, taking notes on observations, and interviews with migrant workers and media practitioners. They become the foundation to piece together a complex narrative about the city's transformation by smart city discourses and technologies. Chapter Two puts pressure on the impossibility - or excess - of access, where ethnography can only take place through mediated speculation whether in the militarized islands or the black-boxed Internet sphere. News reports, satellite images, and videos then become not only the object of study, but also a methodology to cut into the guarded ocean territory. Chapter Three proposes that digital ethnography as a methodology both conceals and foregrounds the materiality of media and air, and therefore, research sites should be at once "specific" and cutting across various imagined binaries such as online/offline, North/South, nature/human.

Chapter One explores the spatio-temporal relations when "smartness" lands in Shenzhen, a southern Chinese city that has a complex history with global capital and national experiments. In 2013, the Chinese Ministry of Housing and Urban-Rural Development issued

the first list of 103 smart city test sites. Since then, smart experiments and technologies have appeared all over the country at different scales and forms. Upon China's nationwide endorsement, smart urbanism is routinely understood through glossy concept videos, government white papers, or the presence of proliferating digital infrastructure. Yet the questions remain: how does "smartness" becomes operational within the historical and social context of southern China? How do the smart city narratives change the imagination and materiality of urban landscapes, and for whom are these experiments designed for?

To address these questions, in this chapter, I examine the city of Shenzhen as a smart model not in the sense of its promise for an optimized techno-future, but primarily as a combination of media and social practices enacted together by urban planners, designers, real-estate investors, and migrant workers. Specifically, drawing from my fieldwork in 2016 and 2018, and discursive analysis of documents and exhibitions, I will explore three dynamics at work in this southern smart environments. First, I will argue that the spatial distribution of smartness in Shenzhen relies on the history of post-reform urbanization. Rather than generating urban resilience, as smartness projects as its central mission, the site-specific smart experiments in fact function as new technologies of dispossession—renewing urban lands, managing migrant labors, and distributes new networks of digital infrastructure. Second, I illustrate how "Smart Longgang," a model project supported by Huawei and the Shenzhen Municipal government, has been exhibited as various urban narratives. These projects demonstrate how the smart discourse carries a logic of optimization to the southern lands: from boosting efficiency in governance, renewing urban land value, to maximizing intercity competitiveness. Nevertheless, by putting these modes of display in conjuncture with each other, I argue that they point to the complex temporality across technological time, national time of development, and everyday time in urban life, rather than projecting a unified vision for the proximate future. Lastly, I argue that these spatial-temporal relations are embedded in the southern urban villages and the site-specific usage of media infrastructures (facial recognition systems, mobile apps, electric bikes, floating populations, etc.). These new infrastructures and platforms become a way through which migrant workers position themselves in the smart urban economy, and at the same time expose themselves at the frontline of surveillance and precarious conditions. Food delivery workers illustrate such polemic dynamics within the process of "becoming intelligent." By situating the broader discussion on smart urbanism and social surveillance within the geopolitical context of southern China, this chapter articulates different interfaces and temporalities between global digital media and urban environments. My argument speaks to previous debates on

Shenzhen's urbanization, media production, and national branding (Yang 2016; Ann O'Donnell et al. 2017). Furthermore, the chapter contributes to growing research into smart cities with critical examinations of a site outside of Northern centers.

Chapter Two brings together the two presumably unruly territories - the Internet and the ocean - to investigate the messy role of networked technologies, and how they reconfigure political authority and legitimacy in the disputed South China Sea. Media's explicit presence in this region contradicts the amount of critical scholarship on how they actually work in the heterogeneous eco-political geographies (Chubb 2016). Invoking the Internet/Ocean assemblage, this chapter focuses on two main threads of arguments. The first traces the construction of 3G/4G mobile cellular network across the islands by China Mobile, the state-owned telecommunication corporation, since 2010. I argue that these media infrastructures become part of a larger attempt to recast political authority through "connectivity" whilst mobile Internet signals increasingly operates as an informal register for oceanic sovereignty. The second argument concentrates on the popular video practices over the artificial island controversy, offering a speculative oceanic perspective in contrast to one through satellite imaging services and commercialized ocean data. Videos thus occupy a central (rather than marginal) role in charting the competing legal discourses and political geographies at sea. These contested mediations both produce material traces of geopolitical struggles and distribute speculations of regional risk and potentiality. In short, the ocean and the Internet do not operate as separate domains; but as co-constitute new digital-political formations cutting across the ontologically separated realms - land and sea, virtual and physical, material and speculative.

My approach here can be seen as first in conversation with critical media studies, which gradually establish an analytical connection between digital network and environmental materiality (Starosielski 2015). The ocean-centered approach also responds to the current discourses on "the cloud" as a default and dominating imaginary of the Internet and digital network at large. Secondly, my research is also embedded within Asian studies scholarship, in particular the theory of political exception and zoning technologies, which has not been fully put in contact with Internet studies. Drawn from experiences of the Asian urban experiments, Aihwa Ong pinpoints the interactions between political exception, production of urban spectacles and speculation. Ong (2011, 207) argues that the rule of political exception allows the continuous rezoning of urban spaces, and the sovereign rule helps to produce spectacular architectures that "attract speculative capital and offers itself as alleged proof of political power." I borrow this particular formation of speculation - an anticipatory logic of economic,

political and aesthetic gains deeply embedded in sovereign power and global capitalism - to understand the messy building frenzy and digital mediation currently emerging in the South China Sea.

Chapter Three investigates how air pollution has been captured as a media event and a political subject and how it reshapes the social imaginary of the global South. Drawing from close readings of news reports of air pollution, I highlight the tensions between smog's trans-boundary potentiality and location-based events in media representations and narratives. These tensions, as the chapter argues, are mobilized to sustain a state of environmental emergency. Instead of re-enforcing smog as disruptive and nonproductive, I demonstrate different forms of capturing smog - from photography, cinema, art projects, and commercial bottled air – as a productive way to understand the shifting social experiences of (polluted) atmosphere. This chapter takes a step further to propose how an atmospheric geography might push forward new imaginaries of the global south and its politics in the time of slow violence and perpetual crisis.

Chapter One

Smart Urbanism in Shenzhen: Southern Lands, Distributed Intelligence, and Everyday Practices

This seems an obvious truth, but we need to say it loud and clear. Urban intelligence is more than information processing.

---- Shannon Mattern. "A City is Not a Computer."

Introduction

During the 2017 Smart City Expo World Congress (SCEWC) in Barcelona, the Shenzhen based ICT company Huawei hosted its own Global Smart City Summit. Under the congress theme of "Leading New ICT, Creating a Smart City Nervous System," Yan Lida, the president of Huawei Enterprise business group delivered an opening speech on how a smart city can be like a living organism that continues to learn and grow, powered by its "nervous systems." He continued to position Huawei in this smart urban vision by saying, "We aim to be *the rich soil* that supports the robust and sustainable development of Smart cities." [1]

This short excerpt from Huawei's self-narrative is emblematic of several broader tendencies in the current discourses on global smart urbanism. First, Yan's depiction echoes a self-referential temporality intrinsic to smart cities: they are constantly updating and "demoing" to generate resilience and to survive long-term shock and crisis (Halpern 2017). Second, if the concept of smartness is increasingly framed as a planetary infrastructural project driven by computation and networked informatics, then the emphasis on biological systems and metaphors gestures towards "urban intelligence" as a much more lively environment beyond information processing, as Shannon Mattern (2017) beautifully articulated in the quote above. Most importantly, Yan reinforces that smart city developers and ICT companies continue to generate self-description in generic and metaphorical languages. As a consequence, the concept of "smartness" is deeply embedded in history and experiences from the global North, even though its test sites, resources, and labor has increasingly taken place in the global South. Nevertheless,

[1] Emphasis added by author. See Huawei's report on Yan Linda's talk: https://e.huawei.com/ca/news/global/2017/201711161546, accessed January 10, 2019.

Huawei's self-comparison to "the rich soil" might, in fact, indicate a way to move beyond smartness's coded language, self-referential temporality and generic sense of space. This connection between the growth of smart cities and the soil should not be understood as purely metaphorical. This chapter takes it seriously as a call to ground studies of smart urbanism within situated histories of the urban lands and the lived experiences of their residents.

To address these concerns, this chapter situates smart cities within the historical and social contexts of southern China, which allows for an articulation of "smartness" and urban intelligence as a set of protocols, modes of display, and practices of cohabitation that are conditioned by and exceed the logic of computation and algorithm. It complicates an imagination of "smartness" through glossy concept videos by tech companies, government white papers, and digital infrastructures and rethinks for whom these urban experiments are designed for and the subjects who actually sustain these intelligent urban processes. Taking Shenzhen as a primary site of analysis, I mobilize *postcolonial urbanism* not as "an urban condition," but as a "critical methodology" (Roy 2011, 308) to analyze how the smart city becomes operational both spatially and temporally. This approach first emphasizes that recent smart urban projects are grounded in concrete geopolitical space and its material conditions, rather than in "zones" that were subtracted from global capital and logistical practices. Moreover, a postcolonial perspective demonstrates a more much nuanced *temporal operation* of smart cities across the past, present, and future (Datta 2018), as well as across national time, technological time, and lived time (Sharma 2014; Fan 2017). In doing so, I demonstrate that "Smart Shenzhen" needs to be understood not simply as "modeling" but a combination of media and social practices enacted by politicians, urban planners, designers, real-estate investors, and migrant workers.

In order to support these arguments, this chapter is organized into four sections. The first section rethinks the spatial expansion of smart cities in Shenzhen as first and foremost the product of technologies of dispossession and management. These smart protocols not only determine the discursive distribution of "smartness" in regional agenda (ASEAN smart network) and urban planning (post-reform land policy in China) but also manage the actual circulation of urban land and human flows (Urban Renewal practices). Moving across different modes of display on urban intelligence in the Longgang district—from its concept videos produced by Huawei to museum exhibitions of urban planning in Longgang, section two discloses the multi-layered temporal

expressions across national time, technological time, and everyday lived time. Drawing from site-specific engagements in Shenzhen in 2016 and 2018, section three investigates urban villages as an intelligent urban environment, which demonstrate the complex spatial-temporal dynamic of smart cities discussed previously, but also open to the entanglement between human bodies and the technologized urban milieu. The chapter will briefly conclude by thinking more broadly about the ramification of studying *Southern* digital environments.

Smart Development on Southern Lands: Technologies of Dispossession and Management

How does a "smart city" become operational? This question prompts as much enthusiasm as frustration since there is no consensus on the answer. However, whether you are a technocrat who believes ubiquitous technologies can help solve the current expanding urbanization, or a politician who takes smart networks as a political promise for effective governance, the question of operation in regards to smart cities constantly orients one's attention towards networked sensors, interactive screens, the Internet of things. All of which are topics that populate every document pertaining to smart projects and dictates the present and the future of urbanity with an algorithmic imagination. Counter to this dominant techno-driven view, this section sets up the example of Shenzhen and argues that the spatial distribution of "smartness" relies on multiple protocols for managing technologies, urban lands, and human bodies, all of which predate and work alongside infrastructural and algorithmic logic. In doing so, I associate smart urbanism in Shenzhen closely with *technologies of dispossession and management,* and how they regulate land usage, human mobility, and urban policies that are embedded in the past and the present of southern China. But before I turn to specific cases on the ground, I want to briefly position Shenzhen within the broader debate on the spatiality of smart cities.

My interest in smart development in Shenzhen does not intend to establish the city as a token example of pluralizing spatial forms in Asian urbanism (Sassen 2008) or as "spaces of exception" to global smart urban development (Ong 2006). Rather, Shenzhen offers a strong site to rethink the commonly accepted spatial imaginary of smart cities as planetary and extra-territorial. First of all, smart cities are fundamentally imagined as *planetary* in their self-description. Scholars frequently cite IBM's 2008 campaign for "a smart planet" as the inaugural moment to initiate discourses on smart technologies and

"smartness."[2] The reference to planetary spatiality, as articulated in Sam Palmisano's speech, differentiates from the previous imagination of the planet as "the blue marble," driven by the globalization of satellite technologies. Instead, the smart planet requires the penetration of computing into everyday life and technological interfaces, both as an extended network of digital infrastructures and an infrastructural imaginary, "an orienting telos about what smartness is and does" (Halpern et al. 2017, 208). Thereby, "smartness" can be quickly adopted by global polity as packaged political and social promises even if the actual infrastructures have barely touched the ground.[3] Second, smart cities are often imagined as extra-territorial, even when they are inevitably entangled in territorial politics. On the one hand, the fast global expansion of smart cities relies on an abstraction of geographic differences, where networked informatics could, hypothetically, achieve a state of unlimited perpetuation. Therefore, it has been argued that smart development operates in extra-territorial, infrastructure spaces rather than national territories (Easterling 2014). On the other hand, the concrete material infrastructures that sustain these smart cities (including the cables, satellites, and policies) must rely on territorial politics, national regulations, and everyday lives.[4] In sum, while the rise of smart technologies is celebrated as a planetary solution to our cities' most urgent crises, and it is often put to work in generic or extra-territorial spaces, we have yet to elaborate on how these technologies actually "land" in different urban environments.

This failure to account for situated spatial dynamics in smart city discourse has been addressed by a range of recent scholarships. One area of research centres on the geopolitics of data centers and storage sites. For example, Mel Hogan and Alix Johnson's work (2017) on global geography of digital data accounts for the entanglement across algorithm, data centers, infrastructures, and spatial politics. Another thread of scholarship examines how smart cities are embedded in deeply unequal social-historical landscapes. Ilia Antenucci's recent work (2019) on urban smart infrastructure

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[2] Sam Palmisano. "Building a Smarter Planet: The Time to Act is Now." Transcript published by Chatham House – The Royal Institute of International Affairs. (2010) https://www.chathamhouse.org/.

[3] This echoes yet differentiates from Paul Edward's "infrastructural globalism" (2006), which pinpoints the centrality of infrastructures and its institutions in the global governance of weather. Also, see Jennifer Gabry's essay "Becoming Planetary" on E-flux journal.

[4] See the recent edited volume *The Promise of Infrastructure* (2018) by Nikhil Anand, Akhil Gupta, Hannah Appel, which presents a strong collection of essays on how infrastructures are made "with fragile and often violent relations among people, materials, and institutions."

in Cape Town offers a refreshing argument against the presumption that smart cities unfold in generic space. Instead, as she argues, smart city development relies constantly on various bordering techniques to control the distribution of resources, segregation of racial populations, and further create new spatial/social borders within the complex urban environment in cape town. These lines of scholarship position smart cities within situated environments that have distinct materiality as well as the historical and political relationship at work.

The language of "planetary" and "extra-territorial" becomes particularly problematic in Asia, where smart cities play crucial roles in national development plans and must operate at the level of cities, districts, and even neighborhoods. According to the 2018 report by the United Nation Economic and the Social Commission for Asia and the Pacific, the "smart city" as a concept quickly gains traction across countries in the Asia Pacific, especially as state-led experiments to solve issues related to sustainable urban development, environmental crisis, and social governance. For example, India's Smart City Mission to build 100 smart cities, Singapore's Smart Nation, and of course, China's national smart development – a plan that has resulted in China managing over 50% of the smart city pilot projects in the world.[5] In 2013, the Chinese Ministry of Housing and Urban-Rural Development issued the first list of 103 pilot smart cities and districts. In 2014, "smart city" was written into national policy documents as one of the three main goals of urban development in China, and this was quickly reflected in provincial and municipal strategic planning. Since then, various cities have witnessed a sudden influx of national investments and hiking numbers of "smart" projects. Yet despite the increasing numbers, these initial smart projects vary dramatically in size, functionality, and form.

Because of the actual practices of smart development in China differ from city to city and district to district, a "smart city" cannot be easily defined as operating under a singular agenda. Most of the token smart cities projects in the world are steered by global tech giants (such as IBM, Cisco, and Google), which offer an infrastructure-driven, extra-territorial model of smart urbanism that can be copied and implemented at different zones. In contrast, smart city first emerged in China as a national discourse led

[5] These projects across the Asia Pacific are similarly driven by a larger national agenda, or an imagined national future - India's Hindu nationionalism, Singapore as a world-class city and a leading economic powerhouse for Asia, and the "China Dream." See "Smart Nation: The Way Forward (Executive Summary)" *Smart Nation Singapore*, accessed February 23, 2019, https://www.smartnation.sg/why-Smart-Nation/transforming-singapore.

and distributed by the party-state, but the micro-scale players—municipal politicians, real-estate developers, national ICT companies (such as Huawei, Alibaba), and local urban initiatives—work as the actual practitioners who operationalize smart visions in various forms. Thereby, smart urbanism in China also exceeds practices of *modeling* that "that shapes, disciplines, and produces particular kinds of spaces and subjects" (Hoffman 2011, 55-56) or *inter-referencing* (Ong 2011, 17-20) that often characterize understandings of Chinese urbanism.[6] Rather, as I will argue later, smart urbanism in Shenzhen relies on protocols of "regeneration," referring to policies and practices that aim to regenerate the quality and value of urban life. These protocols situate Shenzhen's urbanization under the matrix of a national experiment, inter-city competition, global extraction of capital and resources, and increasingly notions of urban intelligence. In this sense, smart cities operate first at the level of policy-making, where nation states can project themselves as the engineer of new nation-building projects enabled by the newly available smart technologies; but also through practices that negotiate the tension between smart city's planetary self-imaginary and its grounded operations at situated urban sites.

[6] What Aihwa Ong called "inter-referencing practices," refers more broadly to "practices of citation, allusion, aspiration, comparison, and competition," (Malden, MA: Wiley-Blackwell., 2011), 17. Smart city as a form of the inter-referencing practices registers as inter-city competitiveness but simultaneously allow new inter-city relationships are formed.

Figure 1.1. Historical images on "Shenzhen Speed and Shenzhen Quality" in *Resonance: The First Shenzhen Urban International Images Exhibition*. Yuezhong Museum of Historical Images, Shenzhen. (Photo by author).

Shenzhen's post-reform urban history reflects the multi-scalar spatial tension and complexity of smart urbanism in Asia. Back in the early 1980s, Deng Xiaoping's "Southern Tour" had established Shenzhen as the pioneer of China's *gaige kaifang* (Reform and Opening up). Shenzhen became the test bed for neoliberal experiments and it was recognized as the first special economic zone in China. As a city marked by the success of national experiments and an economic model, Shenzhen is often framed as a miracle of speed—a tale of how a remote fishing village turned into a metropolis overnight. The temporally motivated narrative of "Shenzhen speed" has been held as a motto for national economic and urban development in the past three decades. Simultaneously, Shenzhen also projects itself as China's "window" to global cultures. As the global manufacturing hub and more recently as a creative, "maker" hub, Shenzhen is representative of China's "worlding" practices (Keane 2007; Lindtner et al. 2015).

However, in 2011, Tan Jie, the Vice-Mayor of Shenzhen announced that "After 30 years of economic development, Shenzhen already has solid economic strength…that it no longer competes with other mainland cities for labor-intensive, export-driven industries" (Tam 2011). He further stated that Shenzhen will shift its emphasis from

speed to *quality*, focusing instead on low-carbon, and sustainable modes of development (figure 1.1). This strategic shift from "Shenzhen Speed" to "Shenzhen Quality" was directly reflected in the Twelfth Five-Year plan of Shenzhen development (2011-2016), which officially writes "smart city" into its long-term urban planning. In this five-year plan, Shenzhen vows to become China's strategic city for new industries, including biotechnology (Pinghsan bio-industry base), clean energy, the Internet industry, the creative industry (wenhua chuangyi chanye), new material industry, and a new generation of information technology. As such, political leaders expect strong support from Beijing, which plans huge investments in technology to make the mainland a science powerhouse by 2020.

Rather than being opposition to one another, speed and quality together have built a conceptual space to understand the spatial-temporality of a smart city in Shenzhen. Whereas *speed* points to fast urbanism and the speedy distribution and materialization of a state agenda as new industry zones, practices to reduce carbon footprints and boost energy efficiency, *quality* further emphasizes the significance of renewal, regeneration that aim to maximize urban quality - whether it is evaluated by city happiness indexes, algorithmic calculation, or market values of set urban units.

Post-reform Land Policy and Dispossession

What is less discussed in this convolution of speed and quality in Shenzhen's smart urbanism, however, is its dependency upon tactics of land management and dispossession. When thinking about the materiality of smart urban spaces, we tend to focus solely on infrastructures, sensors, screens, and devices. But the more obvious material groundings, the urban lands themselves, escape our attention. As I will argue shortly, Shenzhen's shifting *land*scape exemplifies how the primary effect of smartness is to function as a technology of dispossession. To put it differently, the drastic transference of land from the rural to the urban in the post-reform era has been central to understanding the smart spatializing practices in the present. In what follows, I will examine more closely the operation of the smart protocol by analyzing how existing urban lands, as fragmented units of packages, have been "renewed," repurposed, and transferred so that they become a material component for an intelligent urban landscape.

The official rhetoric of Shenzhen as "a city without villages" points less to the disappearance of "villages" than the entangled relationship between the rural and the urban that defines Shenzhen's urban history. This claim is also somewhat ironic given

that a large percentage of its current population still live in “urban villages” (chengzhongcun), a distinct form of informal urbanization through which villages are scattered in between urban districts. Shenzhen-based anthropologist Mary Ann O’Donnell (2017, 108) similarly asserts that the establishment of Shenzhen Municipality in 1979 signals an era of “cities surround the villages” (chengshi weirao nonggun) in Chinese history. The phrase resonates with the Maoist strategy of “villages surrounded the city,” in which the rural was not only the center of the revolution, the villages were organized into collective units in the form of communes, production teams, and work brigades, which supported the cities. The reversal of the strategic focus across rural/urban vividly describes the shifting role of villages for Shenzhen’s urbanization in the post-reform era. Furthermore, these new urban “villagers” have been constantly credited as the pillars of Shenzhen’s economy, yet China’s Hukou system strictly separates “nong” (rural) and “feinong” (non-rural) populations, which not only keep people to their land but also controls how food, housing, and other social resources are distributed unevenly across rural and urban spaces.

In 1979, the largely rural areas of Bao’an County were elevated into Shenzhen city; a year after, in 1980, the Shenzhen Municipality was further divided into two separate zones. The urban area bordering Hong Kong, including Luohu, Futian, Yantian, and Nanshan districts was established as the Special Economic Zone (SEZ) that aimed to attract overseas investments with tax breaks. This internal border is often called "the second line" in reference to the Shenzhen/Hong Kong border as “the first line.” Outside of the second line is called the new Bao’an (including present-day Bao’an and Longgang district) or the outer district, which at the time are still legally administered through its previous rural collectives established since socialist time.

During this transition process, one of the central issues was to negotiate the legal status of “villages” and “rural collectives” and meanwhile integrate previous production teams and work brigades into the new urban-centered apparatus. What is also at stake here is the municipality’s need to find strategies to centralize the semi-autonomous and distributed rural lands outside of the special economic zones (within the first line) under the new market economy and urban planning. The administrative division of Shenzhen into SEZ and New Bao’an County, as O’Donnell (2017, 108) discusses, only “legalized new economic strategies” and “did not transfer traditional land rights from brigades and terms to the new municipal government.” This means that even though the municipality legally owns and administers all the land within its parameter, the villages and previous

communes hold tremendous influences of how lands are actually used and who they can transfer the rights to. Even though now the second line has already been abolished, this discrepancy between administrative power and rights of land usage has created tremendous difficulties not only economically, but it has also hindered formal urban planning steered by the municipal government.

The outer districts, in particular, Shenzhen Township and Village Enterprises (TVEs) in Bao'an District and Longgang District, took advantage of this discrepancy and strategically profited from changing the land function or transferring the land rights to new industries. This has been a crucial factor that allows Longgang (and later Bao'an) to become the frontline of Shenzhen's smart city experiments. The rural collectives repurposed former farmlands for industrial and commercial use, either by registering these lands to be sites for industrial parks, creative clusters or by renewing the old villages into residential compounds (often seen as "new villages" (*xincun*). The wide range of large-scale urban development projects happening in Bao'an and Longgang, therefore, benefit from the fact that these former township collectives took initiatives to transfer usage rights to new industries and often work alongside formal planning visions from the municipality. In Bao'an, there are landmark infrastructural projects such as Shenzhen Bao'an International Airport, and the collaboration between Smart Bao'an with the Shenzhen-based tech developers Intellifusion (Yuntian lifei).[7] Longgang district, for example, hosts two of the world's leading electronic manufacturers Foxconn and Huawei production campuses, in addition to Biyadi, Shenzhen's local electric car manufacturing site. It also launched some of the most high-profile smart city initiatives. Some examples are the Shenzhen International Low Carbon City located at the north-eastern part of the district, and Huawei's Smart Longgang project, which I will discuss in the next section. To summarize with O'Donnell's remark (118), local collectives emerged as "the default urban planners outside the Special Economic Zones and formal urbanization processes in Shenzhen," a characteristic that factors into where and how smart cities land and operate.

In short, outer districts like Bao'an and Longgang have become the pioneers of Shenzhen's smart city development, partly due to their deep connection with the history of land dispossession and repurposing. As illustrated above, smart development in

[7] Bao'an district's strategic collaboration with local and national tech developers can be found through the website of Smart City Bao' an Industry Association, accessed March 12, 2019. http://www.cnscbia.com/

southern Chinese cities such as Shenzhen relies heavily on informal urbanization processes. Rural collectives exercise land usage rights and upgrade the district through building residential complexes, industry, creative parks, and high-profile urban smart projects. The municipality, conversely, is constantly struggling to mediate these informal land transfers, repurposing, and developing projects into its formal master urban planning. Nevertheless, despite their tensions, both formal urban planning and informal land usage aim to maximize land value and profits through redistribution and regeneration. As I will discuss later, urban renewal practices not only influence the spatial expansion of smartness in Shenzhen, but also have direct consequences on the populations living on these lands.

Urban Renewal: Management of Human Bodies and Human Flows

Central to understanding this distributed tactics of land dispossession and management are practices often known as "Urban Renewal" (chengshi gengxin). In 2009, the Shenzhen municipal government released an official policy document titled "Methods of Urban Renewal in Shenzhen." According to its Article 1, the purpose of this legal document is to "standardize urban renewal activities in Shenzhen, upgrade the city's functions, enhance industry structures, improve living environments, maximize effective and collective usage of land, energy and other resources, stimulate sustainable development of economy and society." This includes lands with insufficient basic infrastructures and public services; with substantial security and hygiene issues; with architectures of outdated functions or resource usages incompatible with socio-economic development, which affects the execution of the overall urban planning. In principle, both the municipal government and right-holders of the land can reorganize the area, repurpose the land's function, or demolish existing architectures and rebuild on the land under certain conditions. As such, similar to smart city narratives, these practices of urban "renewal" are driven by the logic of *optimization*, both in terms of efficiency and quality. Urban optimization is not simply reflected in material form (architectures, district function, population demographics, and conditions of living) but also reflected in the redistribution of resources and wealth. Therefore, even though smart technologies are never part of the legal and official language of urban renewal, these similar grounds allow them to collaboratively shape Shenzhen's urbanism in the present.

However, "urban renewal" as a legal discourse and part of the larger land policy should also be recognized as an attempt to undercut the power held by the rural

collectives, who take advantage of the reform policy and make decisions about repurposing the functions of existing land and transferring land rights, as I discussed earlier. Based on the legal language of the document, the Ministry of Land and Resources at State and Municipal levels strictly supervise how and under what conditions land rights can be transferred and redistributed. What the urban renewal policy has proposed is to manage the diverse range of urban renovation projects through fragmenting the land into quantifiable "urban renewal units." Setting this as the operating unit, renovation projects can be easily incorporated into the municipality's annual planning. In reality, the actual urban renewal processes are inevitably caught within these tensions, increasingly relying on a collaboration across newer development needs from the municipality, real-estate developers and the land holders of the rural collectives. [8]

[8] Some of the famous renewal examples are Jiyuecheng (So Fun Land) in Nanshan district, Ningmeng Rencai Gongyu (talent apartments) in Futian District. In the urban village Baishizhou, one of my main research site, these transformation are still yet to take shape, but one can already see how these urban processes are closing in from the awkward new building of Baishizhou's Urban Renewal Office, right next to the village's largest outdoor food market.

Figure 1.2-1.3. Ningmeng Talent Apartment at Futian Shuiwei Cun. Photos by author.

As these collaborative land redevelopment projects become the norm in Shenzhen's "smart" urbanization, what is increasingly clear is that the urban renewal processes not only work as technologies of land dispossession, but also as tactics of managing human bodies and their flows in urban spaces. Nowhere embodies these tactics of management more explicitly than Chenzhongcun, or what are often called "urban villages." The urban village is a product of informal urbanization. However, unlike in other cities, Shenzhen's urban villages are not at the periphery but centrally located in the city or close to large manufacturing factories. Therefore, since their early days, urban villages have attracted new migrant workers because of the relatively cheap rents and their convenient location for everyday life and commuting. The prime locations of urban villages are valuable to the livelihood for a large number of migrant workers, but for real estate developers and landowners, these centrally located parcels of land are undervalued and must be "renewed" to maximize their commercial value and optimize the quality of life for the city at large.

Since 2016, major real estate developers, such as Wanke Group, have targeted these urban villages for redevelopment by borrowing the official rhetoric of urban renewal and the rise of smart cities and new industries. These previously informal spaces are transformed into new residential projects that are often tailored for young professionals in the IT industry and the creative sectors. Consequently, these new real estate projects hike up the land value and corporate profits but at the same time drive migrant workers

out of the spaces that have guaranteed their livelihood.

Take Ningmeng Talent Apartment as an example. It is located at the center of Shuiwei Cun, an urban village in Futian district and it is right next to two major metro stations. The renewal project is modeled on hand-shake buildings (woshoulou), an architectural style typical to urban villages in southern Chinese cities where buildings are constructed so close to each other that neighbors can shake hands through their windows. On one hand, the redevelopment project capitalizes off the aesthetics of the closely packed buildings by putting them in different color blocks—each has a distinctive theme connecting the buildings with communal balcony/walk bridge (Figure 1.2). Each building is also installed with digital security systems with facial recognition and the monthly rent starts from 2500 RMB (360 USD) and upwards for a single studio apartment, which is almost three times the price of the regular rent in urban villages. Furthermore, the narrow pathways in between these buildings are connected not only with electric and internet wires but also aesthetically linked by colorful umbrellas, which serve both as decoration and a practical solution to the constant rainy weather in southern China. Apart from its architectural features, the Ningmeng project also increases its real estate value by converting the ground floor of the buildings into restaurants and shops (figure 1.3). As a result, from its architecture to its organization as a small self-sustaining economy, these residential buildings are advertised as “talents apartments” meant to attract high skilled workers for IT and creative industries, echoing the city's broader agenda to increase the quality and “smartness” in Shenzhen.

A few blocks away from Shuiwei Cun, Huanggang Cun is known as one of the richest urban villages in Shenzhen to benefit from the land policy. From the first glance, unlike most urban villages, Huanggang village is extremely organized and clean with a more uniformed architectural style. Compared to Shuiwei, instead of using a digital security systems each building still has a doorman, usually middle-aged men who have been living in the village for decades. What is new, however, is that there are numerous smart stations scattered across the villages including an e-delivery-pick up storage station (by Fengcao Delivery), and smart fresh fruit and vegetable vending stations (figure 1.4-1.5). We may infer that the installment and application of smart technologies is highly selective across different urban villages and tailored to the everyday habits of their residents. For Huanggang village, where most of its residents are families who moved to Shenzhen in the 90s and all knew their neighbors for decades, everyday conveniences like delivery service and grocery shopping is a top priority and there is

more demand to incorporate smart systems to maximize its efficiency. The smart infrastructures here are grounded in the neighborhood. In contrast, in Shuiwei, most of the residents are young professionals who just moved to the city, and therefore the security of the building is more important.

Figure 1.4-1.5. Fresh vegetable supply e-station (left) and smart delivery pick-up station (right) in Shenzhen Futian's Huanggang village. Photos by author.

Taken together, these redevelopment and renewal projects pinpoint how smart cities

operate on the ground, as discursive and social protocols to manage resources, populations and in particular migrant laborers. Practices of land dispossession from underprivileged population, and broader social practices of urban renewal are redefining and regulating who constitutes "smart" and professional workers. Land dispossession often happens in the name of "urban renewal," and these fragmented packages are re-distributed as part of an intelligent urban environment. As such, by situating "smartness" within the post-reform urban history of southern China, this section argues that smart city operates as technologies that both *spatialize* Shenzhen's urban environments through dispossession and unfold as tactical management of land and human flows. In other words, it is essential to recognize that smart cities are not only products of technological advancement and the expansion of networks, but they also have significant ties to the very land they are rooted in and take shape from.

Exhibiting *Smart Longgang*: Technological, National, and Lived Temporality

The previous section demonstrates how smart cities operate spatially as technologies of dispossession and management of land and human bodies, which can be incorporated into the national development agenda but also in the governance of local urban conditions and population. While spatial processes have been central to understandings of the smart city, questions of temporality have, with a few exceptions, received less attention. In this section, I am interested in unpacking the entangled temporalities of smart cities across technological time, national time, everyday lived time, and most importantly as they are expressed through different modes of display. First, I plan to lay out the key temporal registers as demonstrated in current scholarship on smart cities. Then I will then turn to Shenzhen's Longgang District as an example of how smart time has been displayed as control screen, museum exhibition, and promotional video.

Adam Greenfield (2013) argues most smart city sites live perpetually in a "proximate future," a time that's "always just around the corner - so close as to be practically inevitable - but never quite here yet." Therefore, the operative words for smart temporality are "will" and "can" but never directly address the messy "here" and "now". Tech visions like Siemens take futurity so far as to become "an elegant way of dodging accountability for the frankly incredible assertion being made and more generally, for any failure of the overall smart-city vision to come true" (Greenfield

2013).[9] The language of proximate future is further reinforced by conventional representation of "smartness," such as computer-rendering visuals in concept videos and models, or stylized animations and illustrations. Even when we do get to see actual still or video photography, it is often shot under strictly controlled circumstances and serve as a template. These vivid and enhanced depictions of what new technologies and infrastructures "can" do conceal the reality that these technological promises are never delivered the way they are tactically *rendered* in speech and images. One of the challenges for this chapter is, then, to understand these spatial rendering of smart "futures" in close relation to the lived experiences of the here and now.

In contrast to Greenfield's conflation of the urban present and a techno-future, Halpern et al. (2017) point to a temporal logic from the viewpoint of software development. This refers to a spatial-temporal operation that manages uncertainty and crisis through constantly *demoing the future* as a "version," or a "prototype." The demo is "a form of temporal management that through its practices and discourses evacuates the historical and contextual specificity of individual catastrophes and evades ever having to assess or represent the impact of these infrastructures, because no project is ever 'finished'" (Halpern et al. 2017, 115-116). Demoing then is a temporalizing practice that continues to erase the spatial specificities and geopolitics that this chapter hopes to account for. This updating temporality is also self-referential; therefore, rather than updating to offer a solution to the current problems, smart cities are designed to be resilient, to survive in the long run by being able to absorb constant shock rather than progressing linearly.

Despite their differences, both interpretations have to some extent warned us against the danger of emphasizing the future-driven temporality as the current narrative of smart cities. "The future" is often used as a tactical evasion of social and political responsibilities to the urban present and an evacuation of the specificities of the lived temporalities enacted in urban practice. As Gökçe Günel (2019) has recently argued, what Masdar City shows is how its smart urban initiatives render "the future a thinly disguised version of the fossil-fueled present" rather than a resilient future as it promised to offer. Its urban futures are not only subjugated under computational logic but also

[9] Joshua Neves also discusses how urban development is often associated with progress and futurity, with a temporal notion of "what will be." See the chapter "Underglobalizaiton" in *Faking Globalization: Beijing's Media Urbanism and the Chimera of Legitimacy* (Duke University Press, forthcoming).

intertwined with notions of temporality generated by political agendas and energy demands. In short, the temporal operation of smartness relies on a futurity that both regulates the present and erases historicity.

Ayona Datta has emphasized this dialectic across the past, present, and future by examining the use of the "future" in post-colonial urbanism and in India's state-led smart city development. Datta (2018, 393) argues that "futuring" becomes a practice of imagining and governing cities through *speed*. In this sense, smart initiatives in India are marked by two entangled senses of speed: One at the level of the nation through invoking "an imagined future of Hindu nationhood and the moral state; the other at the scale of smart cities "to govern this future through technologies in the present" (Datta 2018, 395). In post-colonial urbanism, therefore, the complexity of smart temporalities manifests through its negotiation across various scales, times, and power relations rather than simply in its pluralized form. This has been crucial to understand Shenzhen's historical and present entanglement with an imaged national future—Post-reform special economic zone, to the more recent China Dream—and its devotion to reconfigure the city as an urban present marked by technological innovation and experiments. Postcolonial time thus becomes a powerful critique to the proximate and self-referential future of smart cities, and requires a close attention to "particular modes of the historical emergence of regimes of power and governmentality that fundamentally shapes societal constructions of the relationship between past, present, and future" (Datta 2018, 397).

Datta's dedication to understanding what Dipesh Chakrabarty (2010) called "the centrality of time" in postcolonial urbanism brings us to rethink the lack of temporal complexity in Ananya Roy and Aihwa Ong's notion of "worlding practices." In Roy's conclusion in *Worlding Cities*, she argues for the usefulness of postcolonial urbanism as the unsettling and reconstitution of geographic imagination and knowledge, but at the same time, she also acknowledge that such a world project charted a much clearer spatial form than, for lack of a better term, "temporalizing" practices. From zoning practices to hyper-building of spectacular architecture, "worlding" is always already about spatial imagination constituted through practices of building, modeling, and inter-referencing. Even in her brief mention of Shenzhen as a token example of fast urbanism, "speed" as a temporal reference seems more than anything to harness and intensify these spatial forms. As Fan Yang (2017) argues, "speed" becomes such a dominant temporal framing for Shenzhen, such as its post-reform era slogan "Time is Money, Efficiency is Life." Yet, "Shenzhen speed" always needs to be spatialized in some ways: whether

through the construction of the International Trade Building (Guomao) or archived as a series of photos and narratives in the Shenzhen Museum.

Building upon such critiques, this chapter similarly argues that "speed" as a temporal register cannot address the multiple temporalities emerging in the actual urban transformation. In the case of Shenzhen, and more broadly, speed displaces the dialectic relation between past and futures in the global South. As such, following Datta's provocation of "futuring" as a useful concept, in the remaining time, I will turn to Shenzhen's most reported smart project in Longgang district, and examine how the complex temporalities of smartness have been expressed through different modes of display – from control center, urban planning exhibition, to Huawei's promotional video.

Located at the Northeastern part of Shenzhen, the district of Longgang was among the first on the national list of smart city test sites in 2013. Over the past five years, the Smart Longgang project, which has been supported by the Shenzhen municipal government, and has integrated smart technologies in all aspects of public life: housing construction, public health services, education, transportation, and welfare services. Longgang has developed way ahead of other districts of Shenzhen and other sites in the Pearl River Delta (eg. Zhuhai, Panyu district in Guangzhou, and Shunde District in Foshan). This is due in part to the ambiguous language of a land policy that has taken shape since the 1980s—an ambiguity that has allowed the Longgang district to take advantage. As a result, a large proportion of farming and industrial lands have been transferred and repurposed into the development of residential areas as well as new industries, which expedites the smart development in the district.

But to understand Longgang's speedy rise to the most high-profile smart project in the city, we must take into account its strategic collaboration with Huawei, the Shenzhen-based tech giant and a leading global ICT. According to Huawei's company publication, since 2014, Huawei has been actively involved in urban research and provided smart solutions as well as technical support to the district. Longgang was among the first districts to install Huawei's "single-window platform" in optimizing administrative efficiencies. This e-governance smart practice has been quickly duplicated across all the districts in Shenzhen, each rolling out its own all-in-one platform for public services. Such private-public collaboration is certainly not new in global smart city proposals--from Google's Sidewalk Toronto project to Alibaba's Xiong'An New Zone in China. In fact, current global smart development projects are often caught in the tension between techno-futures imagined by global tech companies

and mega-visions proposed by nation-states (such as India's 100 Smart city project and Singapore's Smart Nation). In other words, smart city initiatives are caught between technological time and national time. However, I would like to add, within in the context of the drastic expansion in Shenzhen, these initiative also rely *heavily* on certain notions of everyday lived time in their drastic expansion in Shenzhen. By focusing on how these different visions of "Smart Longgang" are exhibited to the public, this approach pushes me to rethink how temporalities of smart urbanism are constructed and projected across the urban space and forms of media display.

Figure 1.6. Longgang's Smart City Operation Management Center (SCOMC) in Shenzhen.

Longgang's Smart City Operation Management Center (SCOMC), designed by Huawei, became operational in 2017 and since then became a crucial site of exhibition for Longgang's achievement in smart urbanism (figure 1.6). This center works as the control room for managing the smart infrastructures across the city, from traffic monitoring sensors to emergency alert systems. From the publicly released images, SCOMC resembles other more well-cited examples of smart city control rooms (the IBM project at Rio de Janeiro, for example) especially in its spatial organization around one central display screen that is surrounded by multiple computer interfaces and data analysts processing huge amount of data 24/7. As a globally recognized display of smart

cities' operation, the control room presents thousands of sensors, hours of video footage, and data sets all processed through networked screens and processors in the control center and projected through one central screen. It is not only a spatial concentration of intelligence, but a construction of technological time; smart cities are always updating as close as to real-time display of urban life and environments. In other words, operation centers such as SCOMC compress the spatial-temporality of a distributed smart network onto a two-dimensional screen and construct a "real-time" temporal relation across the technologies, networked data, and urban environment.

At a different level, SCOMC is also reconfigured from a control center to an exhibition space and performs operation of urban intelligence to a limited audience. The Longgang district council occasionally organized "official tours" for a selected group of politicians, technicians, and middle school students, sometimes as a demonstration of city competitiveness in tech innovation, other times as political achievements from the leadership, and as a form of nationalist education based on science and technology development. This bring us back to a question raised earlier: even though the smart infrastructures claim to be built for the general public, from the perspective of the control room, it is not clear who these infrastructures are designed for and serve. Furthermore, the display screen not only conceals the extended practices of sensing, processing, and managing the space and population on the ground, but it is also incapable of addressing other forms of lived experience. As Shannon Mattern (2014) reminds us, screen-based interfaces are also incapable of articulating how people experience and tactically participate in smart urban environments beyond their role as sources of data feeding back into the algorithm. In short, the smart city control room displays the urban intelligence as "flat" not only in the sense that a screen-based interface perpetuates the authority of the technological time, but also that it flattens the complex human interactions these technologies facilitate.

Figure 1.7-1.8. Longgang Red Cube exterior (up) and the exhibition of urban development in Longgang District in the urban planning museum (down). Photos by author.

Whereas the two-dimensional screens in the control room present centralization of intelligence both in spatial terms and by monopolizing a sense of real-timeness of urban data, Longgang's Urban Planning Exhibition showcases a much more distributed

geography of smart urbanism that echoes the national time of development and urban renewal discussed in section two. Albeit the exhibition's semi-official nature—which is curated by Longgang district government and echoes Shenzhen's official narrative of reform and development—the material site and its narrative construction speak to the multiple layers of smart urbanism. The exhibition is situated in the newly built cluster of buildings called the Red Cube (aka. Hong Lifang). Located in the Northeastern tip of Longgang district, the Red Cube is a multi-functional architecture cluster that includes a science museum, a children's palace, and a museum of public art and urban planning (figure 1.7). Currently, the three museums are open daily for limited visitors and online pre-registration daily with an official identification card is required. Mainly, they offer educational tours and exhibitions for families and teenagers. Although the Red Cube has yet to become fully operational, one can consider it an effort to generate a public center in Longgang—a cultural landmark similar to the Civic Center in central Futian district, which often seen as the center of Shenzhen.

As illustrated in the exhibition of Longgang's urban planning and development, an inter-district competition of constructing urban landmarks and architectures is embedded in the official narrative of the national time of development. Situated on the top floor of the museum, visitors will walk through a staircase with a timeline of Longgang's key urban achievements: from officially became an administrative district belonging to the Shenzhen Municipality in 1993; the construction of metro line three; the completion of Shenzhen Universiade Centre; and the Red Cube as the most recent achievement of Longgang in 2018. These urban landmarks present Shenzhen's urban development as a linear temporal progression, and are engraved as part of its architecture.

After passing through the timeline staircase and walking into the first part of the exhibition, visitors are immediately led to a multi-media narrative of Longgang that has incorporated the smart logic in all aspects of public life: city housing construction, medical treatment and public health, public education, sports events, transportation and welfare services and community building. The exhibition offers an overview of how these services and infrastructures are distributed spatially across the region but refuses any clear sense of its temporal status; it is unclear whether it is a plan in motion, a plan already achieved, or an imagined future. Take for example the Longgang's smart transportation monitoring system: the system is a wall-sized screen set up with seemingly live data feeds to show visitors how surveillance technologies are already built into traffic control, accident report, and response systems. However, at a closer

look, visitors realize it is a pre-recorded video from the district's traffic monitoring interface that has been projected as evidence of a "real-time" transportation solution. Overall, these exhibition boards hope to invent a sense of optimization of quality of life as well as public resources, both are considered foundational to a smart and sustainable urban life. All of these aspects eventually converge into the "Smart Longgang" video installation. The video projector is placed inside a floating roof structure, across the structure phrases such as "Smart Longgang" and "smart community," are engraved. Standing underneath this roof, one can watch a looped video detailing how Longgang integrated the smart technologies and narratives into its development. The seemingly infinite possibility of smart technologies are intriguing because, on the one hand, smartness is integrated into a linear narrative of national/municipal development, but on the other hand, it is presented as a temporal loop—reminding us of the mode of perpetual "demoing" that is integral to smart temporality.

If these brightly lit exhibitions and digitally simulated video aim to represent the outlook of smart development in Longgang, the second half of the exhibition anchors the district's evolution within the larger urban history of Shenzhen and the temporal mode of land transformation. This part of the exhibition opens with a procession of multi-screen installation, which interestingly turns the focus from the promise of a smart future to shifting cultural geography of the land.

In this part of the exhibition, we trace the contingencies among land policy, urban development, and smart city discourses. The exhibition in this section is titled "The Evolution of Planning," and traces the timeline of Longgang's urban development, particularly through the policies and discourses of urban renewal. First we encounter an LED widescreen outlining the three stages of Longgang's district planning from 1999 to 2030 (figure 1.8). 2010 to 2014 are marked as the period when Longgang underwent a phase of rapid urbanization through cluster development. From 2014 onwards, the planning diverted from its earlier focus of inward development to outward expansion. The latter was ironically called "deep urbanization," since the planning intended to push Shenzhen's expansion towards its eastern neighbors (Huizhou, and Shantou) while at the same time deepen Shenzhen's historical and economic connection with the Pearl River Delta and Hong Kong.

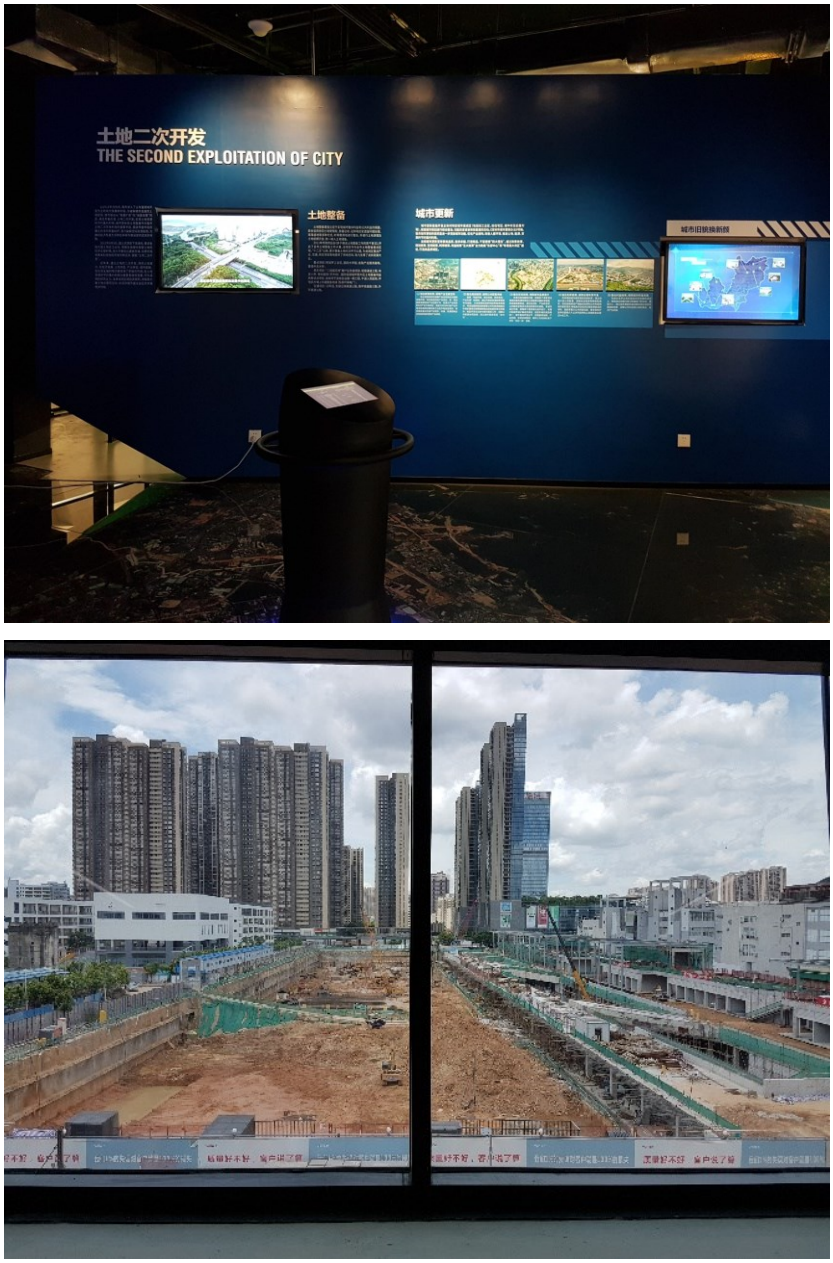

Figure 1.9-1.10. Longgang's urban land development (left) and view of land construction outside the museum (right). Photos by author.

While this sets up Longgang's timeline at a macro scale, the next screen takes us to the central forces driving Longgang's speed of development as is indicated in its titles: "The second development of land" (Tudi er'ci kaifa) written in Chinese, and "The second exploitation of city" in English (figure 1.9). Despite the fact that the titles were meant as direct translations of each other, they articulate slightly different meanings, which I consider a productive mistake. The titles compensate each other and together they depict an honest portrait of the relationship between land and urban development in

Shenzhen—especially given this was supposed to be the "official" narrative. In a sense, the Chinese title directly points out that the main logic embedded within urban growth is the re-development and repurposing of existing land, whether formally or informally. The English title bluntly reveals that these processes are an exploitation of urban policy that has allowed the logic of capitalism and industrialization to take the leading role in transforming urban space, eclipsing the populations living on the land. Or rather, smartness as an official agenda not only drastically accelerates the redistribution and repurposing of land, but actively taps into the neoliberal logic attached to "urban renewal." Thus, urban landscapes are not only transformed, but the social and temporal relationship within are indelibly altered, echoing the discussion on land policy. As such, this exhibition demonstrates how the conditions through which we navigate smart cities as a tangible future: it is both an "official" display of Longgang's development time and entangles with the historical contexts of the southern ground.

Furthermore, only meters away from the museum, one can see the actual processes and consequences of these distribution of land and urban planning. Looking out from the floor where the exhibition concludes, the construction of the rest of the Red Cube cluster is still on-going, with barren lands filled with unfulfilled promises (figure 1.10). Reflecting back to my journey to this new promised land, I took a two-hour metro ride to Long Gang stop through metro line three, and the first thing I encountered was anything but "smart." There were no road signs and clear directions and Gaode map on my phone kept telling me "straight ahead" when there was nothing but the highway in sight. After several rounds of inquiry from other passengers, I finally followed a migrant worker who was on his way to work at my destination. I traversed a busy highway bridge, passed by a newly built high-end shopping center own by Wanke Group—the same real estate investor that has been actively renewing urban villages. Eventually, after ten minutes, I saw the bright red and weirdly angled building standing quite awkwardly among a construction field. As I got closer, several workers were standing on top of the sliding rooftop, supposedly renovating the exterior tiles. The workers who were/are working in over 35 degree Celsuis on the red roof of the building, experience a different mode of time. For them, this land is always associated with fatigue and desperation—the high rise of brand new apartments is not far from sight and the number of expensive cars driving in and out of the Red Cube suggest that the workers have no place and no future on these grounds. In short, while the urban planning exhibition presents an interesting dynamic between technological time and national time of

development, macro-time is entangled with and even relies upon the lived temporalities of residents and workers whose labor is evident but remain unanswered and unseen.

Huawei's concept video for Longgang, "Smart City Solutions for Better Lives" echoes and exhibits this search and struggle for the lived experiences of smart cities that is either entirely missing (in the control room and technological time) or as emerges as a consequence of broader reform (in the exhibition and national time). The video was released in 2017 together with a short article titled "Connecting Families, Building Possibilities: Huawei Solutions Help Transform Longgang into a smart digital city" on Huawei's official webpage. The large-font title juxtaposes the Shenzhen coastline in the background, but in the foreground, it is a medium shot of a young woman and a boy playing at the boardwalk. This non-traditional image of a single-parent Chinese family in Shenzhen is immediately followed by the promotional video, making clearer the indexical connection between smart cities and family relations. Therefore, the video does not articulate "smartness" through the familiar computer-rendering graphics, and aestheticized images of digital infrastructures, but rather as distributed encounters across Shenzhen's everyday urban spaces through a real-life character: a young single mother who specializes in early education.

The video starts with a bird's eye view, situating us in the city of Shenzhen in its present, then we cut to morning time in a regular household: a sudden alarm clock at 6:30 am, we hear the voice-over from the protagonist He Dan, who is later identified as the young woman we saw in the previous photo. As the camera follows her morning routine—making breakfast in the kitchen, helping a boy brushing his teeth—we learn that she is a pre-school educator and the single mother of a three year old little boy. The video cuts from the domestic scene to an aerial shot of a typical busy bridge, leading us into the public urban spaces. We follow He Dan walking through a footbridge, going up in an escalator, and into the metro. The metro stop name "Nan Lang" places us more specifically at the Longgang District in Shenzhen. These everyday settings situate her life and story as one in a million regular families living in Longgang, which as He Dan comments, "In Shenzhen, many young people like me are fighting for better lives." The camera echoes this sentiment by showing a quick montage of passengers on the metro, giving us an impression of the residential demographic in this district: young working class, many have a family and children, who worry about pre-education. The video cuts to He Dan visiting different families in the district—from the sons in the local electric supply and neighborhood restaurants, to the daughter in a photo studio office—to help

these parents to find a desirable kindergarten so that “their children will spend their childhood in a safe, cheerful and eco-friendly environment.”

The video then turns away from these familial portraits and presents how these everyday concerns for ordinary families, such as registering their children in kindergarten, now can be done more effectively through smart solutions. In 2016, Longgang was among the first districts that installed Huawei’s “single-window platform” administrative processes. It is then not surprising that, in the video, He Jie walks into the bright and organized Longgang Administration Service Hall and experiences this networked governmental systems firsthand. She comments on the efficiency and the idea that, you can finish “all in one go” while receiving updates of the kindergarten registration processes through your own mobile apps. Here, we are reminded of a different idea of time as defined through efficiency and simultaneity, both essential to the logic of optimization. Afterward, the video jumps to its concluding chapter, which proposes the types of futures these smart resolutions and technologies might bring. To our surprise, we are led into a local kindergarten, moving across different snippets of children activities both indoor and outdoor. He Dan sits with a group of other pre-school teachers in a meeting, discussing teaching strategies with smiles and clapping hands. The annotation at the bottom left “Education Information Forum” seems slightly misleading, we are not sure whether it is addressing the physical meeting of the educators or the digital platform helping to disseminate education information to the parents. These sequences often only use on-screen captions to signal the existence and operation of certain smart technologies, and in turn, prioritize human interaction over technological connectivity. Or rather, the sequences are a conflation of the two.

Figures 1.11-1.12. Screenshot from Huawei's promotional video "Smart Longgang."

Even though He Dan is a cherry-picked model example, the Huawei smart city video distinguishes itself from the Cisco and IBM examples and illustrates urban intelligence in everyday spaces as well as several intertwined temporalities of smartness. Smartness is time-stamped through everyday routines: preparing breakfast, commuting, and going to work. However, at the same time, we move through domestic, transportation, and institutional spaces. In doing so, the video positions the spatial-temporalities of smart development alongside the present urban lives in Shenzhen. Rather than exhibiting the smart city as a futuristic project driven solely by technical innovation, Huawei conceptualizes Longgang as a task in the present that is deeply tied to intergenerational family relations. Shenzhen's past and present with thousands of migrant workers become part of this path to fight for a "better" future. The video ends

with He Dan and her son playing at the Shenzhen Bay with the city line looming in the background: “Our children will grow happily, like tens of thousands of others (figure 1.11). They will rise to the challenge of building a better future for themselves and for the city.” This voice-over is juxtaposed with images of bus drivers, factory workers, city cleaners working in the city, which tries to re-articulate everyday people into the smart urban future (figure 1.12). However, it does so rather ironically as these labored bodies are deeply tied to infrastructures of surveillance and systems of management and they are included without addressing the precarity of smart city projects imposed on certain parts of the population. Putting these two scenes together, the pointing finger of He Dan to the proximate future once again conceals the past and present of how smartness puts specific population at risk.

To conclude, this section has navigated through three entangled modes of display on Longgang’s smart urbanism: the smart cities control center, Longgang’s urban planning exhibition, and Huawei’s Smart Longgang promotion video. Each of these exhibitions construct and present how smartness operates temporally but not as Greenfield’s proximate future or Halpern’s resilient future of demoing. Rather, they vividly illustrate how smartness operates as continuous temporalizing practices across the past, the present, and the future, and more accurately, across national time of development, technological time of (real-time, immediacy) and lived time of people on these lands.

Becoming Intelligent: Techno-social Relations between Migrant labor and Urban Villages

Up to this point, I have illustrated how smartness operates within the contexts of southern China both spatially and temporally. In Shenzhen, smartness distributes not so much as a “mandate” than as technologies of dispossession and management of policy, rural/urban lands, and human mobility. Furthermore, smart Shenzhen also embodies a multi-layered temporal expression across national time, technological time, and everyday time in its exhibition. However, as the smart city becomes less associated with the proximate techno-future than situated space and time, it is more challenging to articulate how meaningful social relations and the public can still be enacted. In the rest of this chapter, I think through the techno-social relations forged between migrant labor and Shenzhen’s urban environment as they are both “becoming intelligent.” In particular, I focus on informal spaces such as urban villages as neglected sites that enact

different interpretations of "intelligence," which not only entails the proliferation of digital infrastructures but also an emergence of media habits, bodies and sociality.

Techno-social relations, particularly between Chinese migrant labor and new technologies, have been discussed and imagined in several ways: as one of techno-mobility, as demonstrated in Cara Wallis' (2013) argument on the necessary convergence of mobile phones and female migrant workers in China; as one of governance, echoing the state apparatus' conscious use of social structures (i.e hukou systems) and technical systems (like the recent criticism on China's social credit database) to govern urban space and population; or one of resistance, such as in the familiar narrative of workers movements, where the use of digital technology is closely associated with democracy, social justice, and empowerment, as shown in the documentary *We the Workers* (Wenhai Huang 2017). This previous scholarships offer a strong foundation to conceptualize techno-human connections as both site-specific and also an issue of tactics—of visibility, of mobility, and of survival, in some cases.

Perhaps more pertinent to the debates on smart urbanism is the necessity to see the increasing interpenetration between human, technology, and the environments they inhabit makes a clean-cut distinction between mobility, governance, and resistance extremely difficult to identify. The notion of "cohabitation" is not so unfamiliar when thinking of the always-on smart gadgets, the around-the-clock data feedback loop from shopping habits to social media preference, or the increasing intimacy between smart trackers and our bodies. This cohabitation affects millions in urban environments, but migrant workers have experienced and, been represented as, "becoming intelligent" in a much different fashion. They are constantly differentiated from the "majority" yet incorporated when addressing the "public good;" they are both in need of being protected as well as being monitored. These complexities manifest in a recent news report from Nanjing, where smartwatches are given to street cleaners to "support" their work. These smartwatches will automatically "motivate" the worker by saying "jia you" in Chinese (literally it means "add oil" to cheer up and to motivate) if they stay idle in the same spot for more than twenty minutes. The smartwatches also allow the company to monitor and track the workers' locations and work time. Urban intelligence, in this case distributed in the form of smartwatches, performs a way of governing the workers' laboring bodies through *maximizing* their mobility, rather than limiting it through urban dispossession as discussed in section one.

This leads us to rethink what "urban intelligence" really entails and for whom it is

designed for. Shannon Mattern (2017) argues strongly that we replace "smartness" with "urban intelligence," moving beyond a perception of smartness that is strictly computational and instead rediscovering different sites where intelligence is generated and practiced. For Mattern, the notion of the informatic city predates the advent of the computer and is evident the long history of public sites such as libraries, city archives, and museums to name a few. Building from Mattern's argument, I propose that a transition to "urban intelligence" serves as part of my spatio-temporal intervention upon smartness. It acknowledges the necessity to historicize our understanding of the current urbanity beyond computation and algorithms. At the same time, it is not only the infrastructural objects that matter but also the people, the habits, and sociality that shapes the larger ecology of urban information and "intelligence." And lastly, by attuning to these emerging sites and practices in urban environments. The concerns adjust from optimization of all aspects of life (from human activities to natural resources) to "how urban data become meaningful spatial information or translate into place-based knowledge" (Mattern 2017).

In a similar vein, in his welcoming note for the Third Annual Conference of Network Society in Hangzhou, Huang Sunquan (2018) from the China Academy of Art also noted that there seems to be a "mistranslation" between English and Chinese that erases the distinction between "smart" (*zhineng*) and "intelligence" (*zhihui*). He argues that in the Chinese context, the former, *zhineng*, points to an ability to handle multiple expected tasks, but the latter, *zhihui*, focuses more on "our intelligence to deal with complex relationships among people, between human beings and the environments, and our planetary conditions" (Huang 2018). Clarifying this distinction is crucial for rearticulating geopolitics in the age of planetary computing and to think across what he calls the technical (smart city fabric), platforms/institutions (intelligent organs) and agents (intelligent citizens). As such, its conference theme, "Intelligent Urban Fabric," nicely summarizes these critical provocations, invoking a process of weaving together a network generated by techno-driven geography of difference and the fabric of existing lives in the urban environment. What we should examine, as Huang emphasizes, is the new social, economic, and cultural relations as well as the new urban-rural relations woven within this new fabric.

I argue informal urban spaces such as urban villages in Shenzhen are essential to investigating the complex relationships between migrant labor and the fabrics of urban intelligence. Moreover, they serve as a site to explore formations of public and social

connections. In urban villages, the more macro temporalities of Shenzhen—either the national time of progression or technological time of future—are often superimposed upon a much smaller scale or temporal relations within particular neighborhoods or within generations. Large scale billboards holding the smart future and the proliferating surveillance cameras are juxtaposed with everyday life in these transitional urban villages. The difficulty is how to address the distinct spatiality that is "becoming intelligent" while also conjuring various experiences of temporality: revival and decay, excess, everyday rhythm—the lively life cycle inherent to an intelligent urban environment.

Let us start with an urban snapshot from Shenzhen: Nanshan district, an extension of Shenzhen's Nantou ancient city and a now heavily residential area. Most of the residential compounds were built in the late 1990s and early 2000s, merely 20 years old in comparison to the city's 30 years of urban history. However, they were considered outdated as the district council tries to "upgrade" the residential neighborhood and its aged infrastructures. In 2016, the district council tapped into the city-wide hype for smart technologies and attempted to install networked infrastructures such as security systems, smart lighting systems, and facial recognition systems to the residential buildings.

One of the most populated urban villages in Nanshan, Nanyuan community (shequ), was commissioned by the district to be constructed as a pilot smart community. 90 percent of the residents in Nanyuan community are migrant workers, living temporarily across over 15,000 renting apartments. The goal was to use smart technologies to create a more efficient system of registering and governing the floating populations for public safety in the community. Therefore, as part of the "Smart Nanshan" project, the district has installed 600 video door security systems, 625 facial recognition systems, 6 car plate recording systems, and over 2000 smoke sensors (Xinhua News 2018). On average, the system can collect about 5000 car plates and 100,000 facial records per day to secure the community. Residents can use the Smart Nanshan app to access crucial information such as renting records, residential permit registration, and use facial recognition data. As such, Nanyuan community exemplifies how a residential environment for migrant workers and temporary residents are rendered "intelligent" through networked infrastructures. Moreover, these proliferating screens, scanners, and sensors have resulted in a disappearance of human connection and social relation in this urban environment.

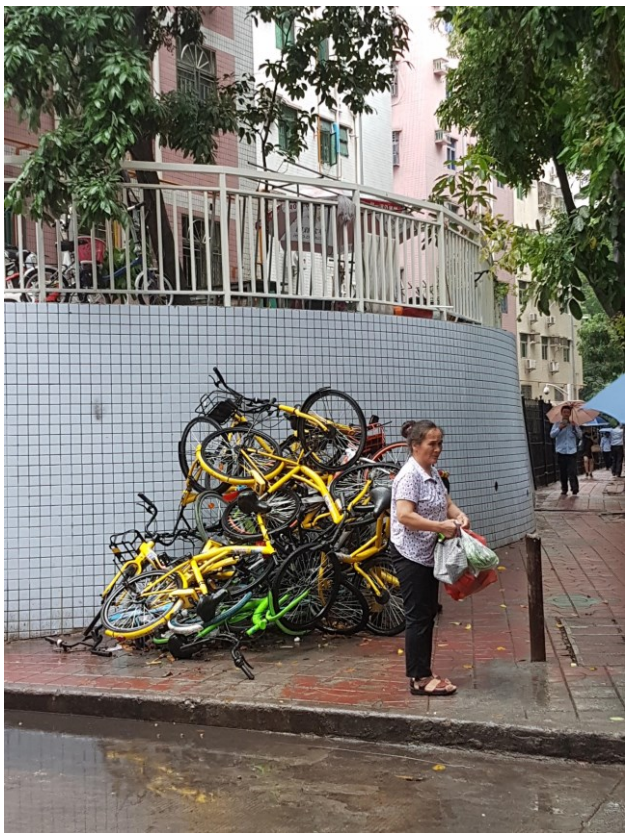

Figure 1.13-1.14. Snapshots of smart infrastructures in Shenzhen: Idled smart screen and security system in Nanshan district (up); An abandoned pile of smart sharing bikes in Futian district (down).

During my fieldwork in Shenzhen in the summer of 2018, I encountered these infrastructures in a much different way. I stayed in a regular residential apartment building in Nanshan that was built in the mid-2000s. Walking in the neighborhood, one can clearly see the traces of heat on the material of the buildings: balconies are rusted and molded spots dot the wall as a result of humidity. The district's efforts to

"regenerate" the neighborhood with smart technologies from 2016 onward are apparent in the newly installed interactive screens by the sidewalk, and traffic sensors at major intersections. However, in merely two years' time, the digital card reader on the door no longer functions, and instead, the glass door almost remain open 24/7 due to the heavy flow of people. Next to the elevators in the lobby, I can see a human-size digital screen standing next to the fire extinguisher and between two Chinese style wooden armchairs (figure 1.13). On the screen, it reads "Nanshan Zhipin" (Nanshan smart screen). At one point, the card reader and the screen held the promise of a "smart future," but today, what they still project every day is a future forgotten, as the material residual in the present that reminds us of the failure of infrastructure. No one seems to care to take them away or renovate them to make it work again. They have become part of the urban landscape where smartness has a clear material cycle of life and death, and leaves its imprint on daily lives in Chinese cities.

Nothing represents this failed smart infrastructure and the decay of intelligence better than the ruins of sharing bikes scattered all over the city (figure 1.14).The yellow and blue bikes were once proof of the success of the sharing economy in China as well as an everyday smart infrastructure. Especially in heavily residential areas and urban villages, these smart bikes, which can be activated, used and paid for with a simple QR code scan from smart phones, quickly became the star of tech investments and a preferred transport method for "the last mile," a phrase that refers to the distance between the major metro and the bus stops to their home. But within a few years' time, because of the excessive input of manufacturing and clustering of similar competitors, a large portion of these smart bikes are now idled, if not abandoned—they have become part of the roads and fences, the trees and sidewalks. They are a physical reminder of the decay of the city's smart vision but with tremendous economic and environmental consequences. They are a part of the urban space itself, a startlingly reminder of the past dream of technology with thousands of tons of iron stacking up on the roadside. In short, both the security systems and the sharing bikes similarly projected a time of decay and *failed* intelligence in everyday urban environments, with inevitable material impact as well.

This is certainly not the only way to think of the "life cycles" of smart technologies in southern urban spaces. As part of the everyday urban life, Shenzhen metro offers a telling example of how "becoming intelligent" is often invoked with the discourse of public safety and subsequently concerns of technologies' biological effects. Even though

the metro security system has been put into place as early as 2010, it was not enforced properly until 2015, when a major public safety incident happened during rush hours. In July 2015, as the train approached Huangbeiling metro station, a passenger fainted in the metro cart and caused a public panic among other passengers. Everyone rushed to the gate, causing multiple casualties by stepping and pushing each other (Yan 2015). It is not a coincidence that Huangbeiling metro is the major transport hub for several urban villages and migrant workers, and local politicians and news media quickly spin the stepping incident into a "concern" for public safety in both the metro space and urban villages, which requires "smarter" solutions immediately. After the metro stepping incident, in the two years' time in between my fieldwork, one can clearly see how this discourse of public safety has reconfigured Shenzhen metro (both the stations and the metro carts) into an *intelligent* surveillance space (figure 1.15). Each station is equipped with an excessive amount of surveillance cameras at every entrance and exit. Even at smaller stations (with two road exits), more than 30 surveillance cameras are mounted and alarmingly stare at each direction.

Figure 1.15. Shenzhen Xiangmei Metro as surveillance space. Photo taken by author.

Excess, however, both makes the technologies more present in daily encounters and meanwhile conceals their operation and purpose. At a closer look, these surveillance

cameras are not only manufactured by different companies but most importantly they imply a multi-layered system of surveillance at work in public spaces. For example, cameras from Dahua, a smart technology company from Zhejiang, are extensively connected into Shenzhen's police communication and monitoring systems. The other commonly seen cameras are from Santachi (an Asian regional security company across Singapore, Hong Kong and Shenzhen) and Pelco (an American-based security and surveillance technologies company). Both companies offer networked video surveillance services for commercial use. Lastly, it is worth noting the presence of cameras from Intellifusion, an artificial intelligence and tech developer founded in Longgang, Shenzhen. Intellifusion has offered facial recognition systems and other smart solutions to both government institutions and commercial companies. In this brief sketch of the variety of surveillance cameras, my intention is not necessarily to reinforce an Orwellian dystopia of big brothers, but to call for a much needed attentiveness to the nuances across a seemingly hegemonic infrastructure of surveillance and intelligence.

Outside of this technical network of security cameras, the human bodies present in the metro space also mark it as a site of surveillance. One can often see new civil security teams (zhi'an xunluo), mostly young men in their 20s, patrolling not only inside the stations but also on board the trains. They often hop on and off major transit station in small groups of 2 to 3 people with full equipment such as two-way radios and baton, which differentiates them from regular unarmed security guards in metro stations. From their regional accents, one can also infer that these young men are migrants from other parts of China. In various urban villages, we can see a similar pattern to use young male migrant workers as civilian patrols, often in collaboration with stationed police forces in the neighborhood. In addition to this problematic convergence of migrant workers' bodies with existing structures of surveillance, there is also an increasing concern over radiation effects from the X-ray body scanners that are equipped in key metro stations. After the airport-level body scanners were installed and put into use in Shenzhen in 2017, residents have raised questions over the necessity of such strict protocols for everyday transit, and more specifically about the negative effects of close contacts with X-ray scanners as part of daily routines (Deng 2011).

What I have illustrated so far is that, by following the lived traces of urban intelligence, our attention is directed to the multiple life cycles of smart technologies in their immediate and durative contexts. In the meantime, it sets up one techno-social relation, in which migrant workers in Shenzhen have been actively recruited to be part

of the city's urban surveillance infrastructures, with their bodies at the frontline of the city's urban safety and simultaneously exposed to technologies' unknown effects. With this in mind, I want to zoom in further to look at a particular group of migrant workers, food delivery workers, and how they constitute part of the intelligent urban fabric while rendering urban villages as a neglected space of intelligence.

Getting off metro line 1 at Baishizhou metro station, and taking exit C with hundreds of young people at rush hour, I arrived at Shenzhen's largest urban village Baishizhou. Unlike the skyscrapers and modern business architectures at Gao Xin Yuan (IT Park), just one metro stop away, there are no obvious signs indicating the start of the village, except the triangle public square in which hundreds of smart sharing bikes line up nicely. The security booth just meters away indicates the separation between public streets and the start of a carefully surveilled space. The same group of young people who I got off the metro with are now headed in all different directions. Some went straight to the sharing bikes, took out their phones, opened Wechat QR code scanner, and "beep," activated the bikes, now becoming part of a larger network of transportation data sets and the moving urbanscape of Baishizhou. Some walked through the narrow streets in the village, buying groceries or quick dinner at the street shops and skillfully scanned the QR code at the counter to pay. In less than a minute infrastructures are activated, consumed, and then resume their idle status until the next resident passes by. What strikes me in this first glimpse of Baishizhou's urban environment is how intelligence has been distributed extensively into urban spaces through everyday tools and activated in the most mundane encounters, consumptions, and life habits. Even though these intelligent technological infrastructures are similarly excessive and subject to decay, they are more accurately described as waiting to be woken up, activated, and re-generated - to borrow the official language.

My attention to platform-based food delivery service is at first driven by its obvious presence in urban village life and the dominance of migrant labor in its operation. The current food delivery market is dominated by two major e-platforms—Meituan and E'le'me. According to Meituan's research report based on its platform data, up until 2018, there are 270,000 delivery riders nationally, and over 70% of Meituan riders originally come from rural areas, whose income mostly goes to support their family at home (Xinhua News, 2019). As migrant workers compose the majority of delivery riders, it is not surprising they occupy a central role in urban villages such as Baishizhou. As mentioned before, urban villages are products of informal urbanization

in Shenzhen, and their relatively cheap rents, convenient location, and self-sustained community have not only attracted large numbers of migrant workers but also small businesses and restaurants. Food delivery services tap into the confluence of cheap labor and the centralization of restaurants. Furthermore, Baishizhou is also minutes away from the offices in Hi-Tech Park (Gaoxin yuan), Oversea Chinese Town (Huaqiao cheng) with its new creative industry cluster, and Windows of the World theme park, which makes it a primary location for food delivery services. In this context, food delivery workers not only live in these urban villages but also camp around its public spaces to maximize their daily delivery efficiency and numbers (figure 1.16).

Figure 1.16-1.17. Meituan food delivery workers gathering in Baishizhou's public

spaces (up) and in front of the service center of So Fun Land (down). Photos by author.

Smart delivery services are not only spatially tied to these informal urban spaces, but also unfold according to the lived temporalities and rhythms in the neighborhood. Usually around 10:30 am, at several key intersections and public space in the villages, these young, male delivery riders will cluster together with their late breakfast or early lunch, chatting about their daily life: how much they earned yesterday or the world cup football match they watched late last night. As the chatter continues, they also constantly check their cell phone as if waiting for something. As soon as it hits 11 am, the usual chatter stops, everyone nervously stares at their cell phones, and within a few minutes they spread across the villages with different orders coming in from nearby offices, hospitals, etc... At certain points in the day, these migrant workers on their electric scooters become part of the moving architecture of Shenzhen's urban life. However, at other times, they constitute part of an intelligent infrastructure that is yet to be activated; yet to play their role in the life cycle of the city.

On the other hand, the relationship between delivery workers and smart platforms is a highly tactical one. For example, many food delivery workers will wear the uniform of one company but the delivery box on their motorbikes belongs to another. They work across multiple apps and often collaborate with small local restaurants who cannot afford to get into the two major platforms. These tactical decisions, a first glance, seem to fit in with larger entrepreneurial discourses, yet these "smart" practices are combined products of the everyday pressure of survival and a collective wisdom of the "dos and don'ts." Their public gatherings then become essential in the sense that these workers have the chance to exchange information about the fastest routes, offices that give better tips, and where the most popular food spots are (figure 1.17).

We should also be cautious not to romanticize these survival strategies as a sustainable form of subaltern agency. The way for these migrant delivery workers to enter the larger smart urban economy inevitably builds upon their precarious labor conditions. As one of them jokingly said: "from 6 am to 3 am the next day, as long as you order, there will always be someone who is willing to deliver it for you."[10] The precarity of delivery work is further built into the smart platforms as a reward-punish

[10] The quote was from one of the conversations with the delivery workers during my fieldwork in Baishizhou urban village in the summer of 2018.

system, which is based on whether or not they can deliver on-time. It does not take into account external factors such as traffic, weather, etc... Whether it is picking up tasks across different platforms or working with the rhythms of the village, the intelligent practices of the migrant workers still do not qualify them as “smart citizens,” a category that is often narrowly defined (Townsend 2014; Noveck 2015).

Food delivery workers are often imagined as individuals - delivering between the restaurants to particular customers—but what is intriguing, as the above photo highlights, is how they, in fact, exist as a collective, often in informal spaces such as urban villages. By thinking about food delivery as a collective of bodies we can, in some ways, reject the algorithmic logic that automatically absorbs them as data population. Rather, they are now woven into the intelligent urban fabric in the form of service, of skills, and of opportunities for a better life.

Figure 1.19-1.20. E'le'me food delivery platform's advertisement in Shenzhen Futian metro

In this regard, e'le'me's rebranding of these precarious delivery workers as the "new urban chivalry" needs to be analyzed more critically. Since 2017, E'le'me has actively cultivated a campaign that established their delivery riders through public advertisement in metro stations, roadside billboards, videos, and on its own delivery boxes. For example, in Shenzhen's Futian metro station, one of its largest transition stops as well as connected to the civic center, E'le'me put up a public advertisement covering one of its transit tunnels (figure 1.19). As figure 1.20 show, the food delivery rider, with his blue uniform and blue delivery bike, is superimposed upon a generic city landscape marked by the white geometric buildings and blocks. They seem entirely out of place in the generic urban landscape, somewhat ironically echoing the workers' dislocation from their hometown in addition to the actual urban spaces. Most importantly, as the billboard suggests, they are the urban faces who embodies the "chivalry spirit." The concept of chivalry originated in the Middle Ages and refers to both the Christian institution of knighthood and the social code of conduct for knights or men in a more general sense. Therefore, E'le'me re-appropriates the notion of chivalry aims to construct a public collective identity that connects with royalty and efficiency. Nevertheless, this also means the riders are not only governed by the digital platform's intrinsic protocols but also a social code of conduct, such as social responsibility, family values, etc.

E’le’me’s promotional video, “E’le’me, qishidao jingshen” (chivalry spirit), demonstrated the chivalrous dynamic embedded within the new urban campaign. The video was produced in 2018 and released and circulated across Tencent Video, and 51Vime. The video deliberately uses anime-style visuals and hip-hop music to present the difficult journey of a food delivery worker. Apart from the video’s creative aesthetics, the story portrays the delivery worker through a figure of young men who are about 25-30 years old is the average age of food delivery workers. The delivery journey is dramatized through the conflict between the food delivery workers and three monsters (rain, heat, and hunger), and implies the precarious conditions these workers face on a daily basis: extreme weather conditions, traffic jams, and customer complains. The video is important because it portrays the urban hero, yet at the same time, it points out how the delivery worker’s labor is conditioned by the platform protocols. This becomes even more evident when e'le'me encouraged the collaboration between delivery labor and video platforms, and rather than relieving them, it adds a second layer of social protocols on top of their labor.

To some degree, this reconfiguration registers food delivery labor as a collective in the current smart urban economy. But the emphasis on the spirit of chivalry might, in fact, add to their precarious condition by imposing a performative social role on these workers. For example, when E’le’me officially collaborated with mobile-phone based video production and sharing platform “Pear Video” in May 2017, the goal was to encourage food delivery workers to use short video formats (usually between 1-3minutes) to self-represent their labor. In this screenshot from Pear Video, these self-representations were often contradictory. Many of the videos are about their social service work (taking care of the elderly and the sick) as a necessary part of the urban chivalry, while others celebrate an optimization of their delivery labor through doing night shifts and employing strategies to solicit good reviews. What is also increasingly evident is that these short video productions and distribution both work as voluntary forms of surveillance from the delivery workers and new forms of documenting unsatisfactory services by customers.

As we shift our attention from a techno-driven notion of “smartness” to how various urban intelligences are activated and practiced, what this section presents are various techno-social relations between migrant laborers and the very urban environment. Migrant workers have been woven into the intelligent urban fabric in various ways: through putting their bodies at the front line of the city’s public safety while exposed to

excessive surveillance; as delivery service workers that both take advantage of the smart digital economy while at the same time they are imposed upon by platform protocols and social responsibility. In short, migrant workers constitute a crucial part of the intelligence in Shenzhen's urban environments, yet they are always already conditioned by it as non-intelligent and non-citizens.

Conclusion: Southern Lands as Digital Environments

In conclusion, this chapter situates the discussion of smart urbanism within the historical, social, and lived contexts of the southern Chinese city Shenzhen. In doing so, it re-examines several key pre-existing assumptions and narratives generated by smart city initiatives, and furthermore, it illustrates that what smart cities actually produce on these southern lands. In the spatial conception, smart cities are consistently imagined as planetary and extra-territory, even though they are inevitably entangled with territorial politics and national urban planning. In this sense, while smart urbanism often directs our critical attentions to the technological networks, screen-based interfaces, and the algorithms, this chapter argues that Shenzhen's smart development ties closely to the city's distinct urban transformation in the post-reform era. Therefore, smart city must operate as technologies of dispossession and management of urban lands and human labor. These situated spatial dynamics also push us to question the temporal logic intrinsic to the "smartness mandate," which is not only driven by the proximate future, but also relies on a temporalizing practices of "demoing" in order to generate resilience in the face of constant urban crisis. By tracing the multiple forms of displaying smartness in museum exhibitions, operation centers, and lastly concept videos, Shenzhen demonstrates how smartness becomes entangled within the dialectic relations between technological time, national time of development, and lived time. And subsequently, these new spatial-temporalities are enacted most noticeably in the transient urban spaces such as urban villages, and by migrant labors who constitute a significant part of an intelligent urban network but constantly remain unseen.

This chapter makes a strong case for that urban lands become a vibrant digital environment where smart city means more than installing digital networks. Rather, this southern environment is historically constructed, with has intimate relations with southern China's land appropriation and re-development. It is also socially enacted, where urban intelligence are distributed through everyday media practices, through management of human labor. Nevertheless, moving beyond southern China, the next

chapter investigates how land remains central to knowledge production and political authority in the disputed South China Sea. Yet these turbulent oceans also open a conceptual space to explore the overlapping digital environments—from Internet signals, satellite imageries, and video practices.

Chapter Two

Internet/Ocean: Digital Topographies in Disputed Water

Figure 2.1. Screenshot of the "Welcome to China" roaming text message

Introduction

On March 29, 2014, Philippine officials invited Western reporters onto a vessel sent to resupply the Sierra Madre, a rusted WWII warship deliberately stationed on the Second Thomas Shoal (aka. Ren'ai Jiao) since 1999 (Perlez 2014). This rusted warship, with a small number of Filipino soldiers on board, was a ghostly reminder of the Philippines's presence, meant to reinforce their sovereign claims over the reef. However, as the reporters boarded the Sierra Madre, they received a roaming notification message on their phones: "Welcome to China" (figure 2.1). The message was later confirmed to have been sent by China Mobile, the state-owned telecommunication network whose signal footprint has covered the Spratly Islands (aka. Nansha Qundao) since 2007 (Tech ifeng 2014). This non-confrontational political encounter signals a crucial but under-examined entanglement between the Internet and the Ocean. Unlike the political domain clearly defined by international laws, the Sierra Madre incident reminds us of the often messy

digital-political formation taking shape in the South China Sea, marked by fuzzy maritime boundaries, overlapping sovereignty, and contested digital networks.

This chapter thus brings together two presumably unruly and ungovernable territories - the Internet and the ocean - to investigate how digital media shape and reconfigure political authority in the South China Sea, a question that too often falls in the hands of a few politicians, military strategists, and gated institutions rather than people who connect to or inhabit this region. Specifically, I take up "Internet/Ocean" as a conceptual scaffolding to examine popular cultural narratives, media infrastructures, legal discourses, and contested mediations emerging in the disputed ocean environment. Moving across multiple controversies around the South China Sea--sovereignty claims, telecommunication networks, and land reclamation -- I argue that this new topography of disputed water relies on the construction of a *speculative* digital space, particularly through mobile Internet signals and Internet video productions. To put it differently, rather than simply ask how the Internet represents territorial disputes at sea, this chapter instead explores what it means to look at the ocean and the Internet not as separate domains but as co-constituted. This draws our attention to a new form of political and cultural spatiality that cuts across what seem to be separate realms - land and sea, virtual and physical, material and speculative. The composition "Internet/Ocean" operates as an analytical scaffolding for this chapter. Linguistically, "/" is a substitute for the conjunction "or" (exclusive) and the conjunction "and" (inclusive). It is used to present both a conflict and a connection between two things. Thereby, the slash in this composition suggests that while the two realms may remain distinct at certain levels, my aim in this chapter is to examine them relationally.

Using Internet/Ocean as a critical approach, this chapter first rethinks the land-centric conceptualization of maritime space. Historically speaking, land has dominated how ocean space is governed and imagined, in particular through the United Nations Convention on the Law of the Sea (UNCLOS). And this land-centric framing has direct impacts on the ways in which Internet infrastructures and signals are currently politicized. The development of Chinese mobile cellular/Internet networks in the South China Sea attests to the global territorialization of maritime space. But most importantly, it showcases how this normative land-centric framing enters cultural imaginaries through

the nation-state, telecommunication companies, and the military. Furthermore, the perspective from land has problematically shaped notions of territory and legality. In the Sierra Madre incident, from the perspective of the People's Republic of China, the signal picked up by an old model Nokia phone not only indexes the expanding media infrastructure in the region but also extends an existing popular cultural imaginary of China's ocean sovereignty through signal footprint. In this sense, mobile networks attest to how media infrastructure marks "politically defined territorial space of control and are integral aspects of states' territoriality" (Tawil-Souri 2015, 158). However, standing on the rusty warship, this mundane roaming message operates as a material reminder of the unstable legal and political boundaries at sea. In this brief moment of contact, even though the mobile signals are *legible* to everyday devices, they are rendered "illegal" from the Philippines's position, occupying the last maritime frontier offshore. What this example of contested signal legitimacy makes clear is how the separation between land and sea is tactical and mobilized to serve particular political ends.

I build from these grounds and move towards my second argument. While territorial-centered policies remain present in negotiating regional disputes, this chapter instead *speculates* from an oceanic perspective - the moving tides animated through video. This analytical shift from a land-centric perspective to "looking from the ocean" manifests first through the competing legal discourses around maritime delimitations, but very quickly spills off into contested modes of mediation. Satellite data (both commercial and military) ~~a~~nd Automatic Identification Systems (AIS) are widely accepted and used as *solutions* for global maritime security and surveillance, and they have dominated regional knowledge production of the South China Sea (Airbus Defense and Space 2015). These high-resolution satellite images are commonly circulated as authoritative "evidence" by state institutions, military strategies, journalists and general public alike. In contrast, video's technical and aesthetic specificities embody a *speculative* position from the sea that is often perceived as less legitimate than those more authoritative forms of mediation. This chapter instead emphasizes the central role of popular videos in this emerging digital-political geography at sea, and videos offer different points of political engagement, contingent on their distinctive aesthetics.

In recent popular and academic literature, the South China Sea dispute has been understood mainly through political science approaches, and seldom as an issue of *media* or *media space*.[1] In China's official documents, for example, the Twelfth Five-Year Plan for National Ocean Development (2013-2018), communication media is never discussed as a strategic focus despite the fact that telecommunication (*tongxin*) is occasionally credited as sustaining regional surveillance and maritime safety (State Oceanic Administration 2013). This is particularly problematic when acknowledging the dual transformation happening in the region: large-scale anthropogenic activities are drastically changing the ecological landscape across the vast area bracketed under the South China Sea; these environmental transformations are highly mediated and distributed as part of the political reconfiguration currently underway. The controversial race of island building has put the disputed archipelagos under constant surveillance and processes of mediation, from satellite images, news coverage, Internet videos, to data maps and simulations. These contested modes of digital mediation turn the disputed territory into a terrain where "viewers only see and experience the dispute and the region through circulated media images and videos" (Hochberg 2015). In other words, the region's physical opacity determines *the centrality of mediation* in understanding the political and legal tensions in the South China Sea. Media's explicit presence in the region contradicts the limited amount of critical examination of how digital media is put to work in this highly unstable and heterogeneous eco-political geography.

Andrew Chubb's (2016) recent work offers a notable exception. He argues that both state-run traditional media and online media are crucial to the emergence of popular nationalism, which increasingly operates as a "foreign policy weapon" with respect to maritime disputes.[2] While I agree with Chubb's effort to articulate the crucial role of

[1] For instance, David Jay Green's *The Third Option for the South China Sea: The Political Economy of Regional Conflict and Corporation* (Palgrave Macmillan 2016); Peter Kien-Hong YU's *Ocean Governance, Regimes, and the South China Sea Issues: A One-Dot Theory Interpretation* (Singapore: Springer Science+Business Media 2015); Thanh-Dam Truong and Karim Knio's *The South China Sea and Asian Regionalism: A Critical Realist Perspective* (Springer 2016)

[2] According to Chubb (2016, 22-24), there were three main mediated ways for the CCP to strategically channel popular sentiments into political opinion on South China Sea controversy, including dependency on official information through state-run media such as CCTV channels and People's Daily; the emergence of nationalist opinion leaders both in and outside of the

media in maritime disputes, I diverge from his approach in several ways. His argument mainly concentrates on the impact of media in shaping citizen's political opinion, but in doing so, he simultaneously flattens both traditional media (newspapers, TV programs) and Internet-based media as "containers" of political information and popular sentiment. For him, what differentiates Internet media from "traditional" media (despite this being a highly problematic categorization) is thus simply degrees of control and the kinds of political attitudes they produce (Denemark & Chubb 2016, 59). This chapter instead closely investigates both the material infrastructure and popular discourses of the Internet at sea, and how they are deeply embedded within the broader history of oceanic management and political disputes. I argue that Internet media constitutes the material manifestation of regional struggles rather than a medium for political contents. Furthermore, Chubb compares the state-led opinion channeling to "flood control and irrigation," and this hydrologic analogy allows him to imagine China's "networked authoritarian state apparatus as a high-tech dam, behind which swirls the elemental force of mass sentiment" (2016, 22). In this chapter, I challenge this one-dimensional analogy between authoritarian state and media control, between floods and dams. Instead, I propose to analyze the different ways that the state, the Internet, and the disputed ocean assemble in both material and imagined ways.

As illustrated above, these issues within the political science approach to the South China Sea push researchers to engage directly with film and media studies, and more specifically with Internet studies. Among other scholars, Metahaven (2013, 7) has provocatively argued that "What was once thought to be the 'Internet,' a deterritorialized space among a world of nation-states, is known today to be incredibly saturated with the spatial implication of borders, jurisdictions, and sovereignty." What they refer to is the increasing efforts from both the state and non-state actors to re-territorialize the Internet, data centers, and digital information at large. This chapter partially derives from this current anxiety over reterritorialization of Internet space and infrastructure. However, Internet/Ocean as a conceptual framing diverts from more registered metaphors in current scholarship in media studies: walls, gateways, and "the cloud" (Hu 2015; Li 2016), and instead accentuates the oceanic imaginaries that have yet to be fully unpacked in studies

military; lastly, systematic media guidance and Internet censorship.

of global media. Nicole Starosielski (2015) and Lisa Parks (2015) offer two notable exceptions, bringing aquatic materiality back into studies of the global Internet. Their materialist approach brings into view the significance of coastal politics and island networks to sustain the undersea cables in the Pacific, and how water distribution networks become crucial to the development of the mobile Internet in Africa. While I follow their materialist approach, I also highlight the intricate role of cultural production in mediating both Internet connectivity and maritime rights, especially popular media practices that are crucial to political formation in Asia.

In light of these concerns, each of the following sections explores how the Internet/Ocean assemblage unfolds through popular discourses, material infrastructures, and forms of mediation. The first section outlines the complex ecological diversity, legal and sovereign indeterminacy, and anthropogenic activities as the backdrop for the entire chapter. Upon this eco-political geography, Internet/Ocean invokes the vernacular cultural imaginary of "Internet (as) Ocean" in Chinese, which has been pushed aside by other dominant formulations in Chinese Internet studies. The second section then turns to the reverse imaginary "Ocean as Internet" through examining the recent expansion of mobile cellular and Internet network in the South China Sea. This section is not an ethnographic study of the Internet infrastructures. Instead, it situates them within a land-centric conceptualization of global maritime space and popular discourses of "everyday connectivity" constructed by the nation states, telecommunication companies as well as the military. The last three sections focus on the overlapping legal discourses and contested mediation revolving around the proliferation of artificial islands in the South China Sea. In doing so, it critically examines the problematic eco-legal framing set by the Law of the Sea, and upon this shifting landscape of legality, it highlights how videos present a different regional engagement than satellite imaging.

(Dis)connectivity: The South China Sea Revisited

The South China Sea is a semi-enclosed sea area of 1.4 million square miles, connecting the Indian Ocean and the Pacific Ocean whereas south to the Chinese mainland. Geologically, it is a difficult terrain to navigate due to the thousands of rocks, reefs, and islands scattered and hidden across the massive ocean space. Historically, trading

activities of fishermen as well as exploration by various imperial powers all left their marks on the maritime space (Hayton 2014).[3] Closer to contemporary times, however, the South China Sea is perceived as one of the most disputed oceanic territories because of the competing territorial claims made by the neighboring nation-states: the People's Republic of China, Taiwan, the Philippines, Indonesia, Brunei, Malaysia, and Vietnam. This sovereign indeterminacy has often resulted in hostile standoffs between fishermen and military patrols.

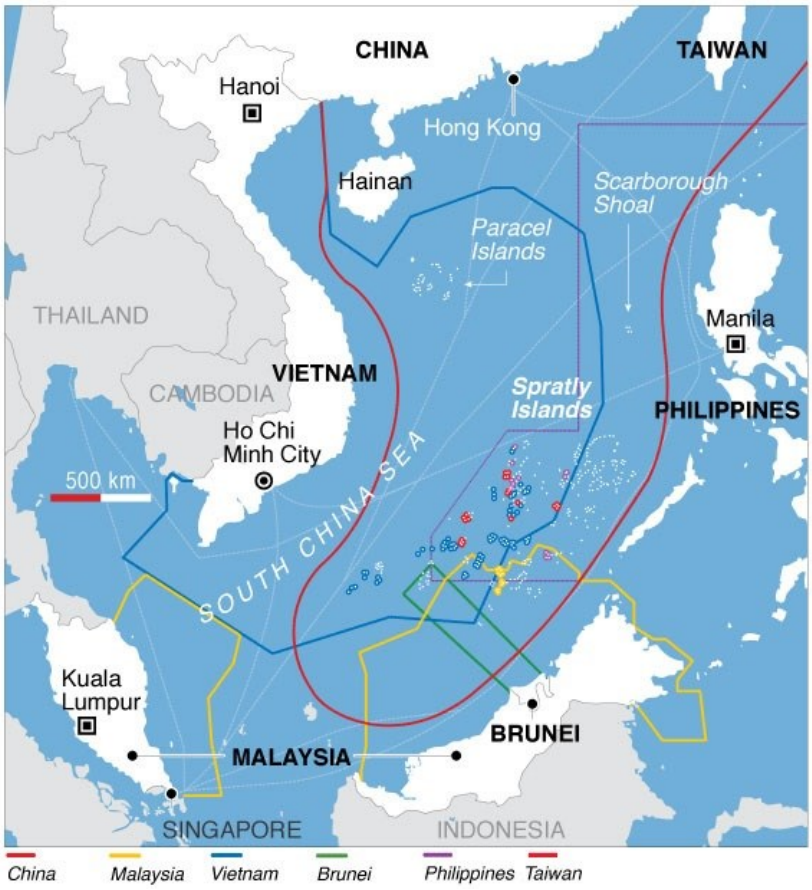

Figure 2.2. The South China Sea Maritime Claims Map. *Voice of America.* 31 July 2012. Wiki Commons.

Central to this oceanic dispute are two competing logics of legitimacy, especially regarding issues of maritime delimitation. The United Nations Convention on the Law of

[3] The imperial history of the South China Sea has left most of the reefs and islands named after the Western explorers who first claimed to set foot on.

the Sea (UNCLOS) agreed upon certain legal categories, which allowed coastal states to claim a part of territorial water, and the right to explore its fishing and energy resources. China, however, insisted on its historic rights and claimed sovereignty over the majority of the South China Sea. This claim was often known as the "nine-dash line" drawn in the 1940s by the Prime Minister Zhou En'lai. Since then, historical documents and maps were published and updated to legitimize China's presence and authority in the region (Heydarian 2018). What this results in is an imagined oceanic geography based on border lines that crisscross on the map (figure 2.2). Because of these unresolved tensions, relevant nation states have used a range of strategies to reinforce their claims and activities in the territorial waters: physical occupation of uninhabited land mass (putting up national flags), strengthening military presence (patrol ships, outposts), publishing historical maps and documents on early trading activities, and building temporary human settlements in distant islands.

These long-standing controversies, rather than putting the region under global scrutiny, ironically have kept the region disconnected both literally and metaphorically until the 1990s. Due to its political uncertainty and spontaneous conflicts, civil access remained largely impossible apart from a small population of authorized personnel: local fishermen, workers on offshore oil drilling platforms, as well as transit vessels. Public information about the South China Sea relied heavily on state-produced visual materials and narratives - maps, television documentaries, and news footage - and fixated upon a historical narrative of "defend the southern frontier" (*Baowei nanjiang*), originating from 1979 Sino-Vietnam warfare. Limited access and imagination also had its material imprints: Development of media and communication infrastructures across the archipelagos were extremely slow and challenging. Postal service had been the major communication channel since the 1950s, which connected island outposts to the mainland through coastal provinces such as Guangdong and Hainan (China Mobile Hainan News 2012). In short, this vast oceanic-island environment, at least until the early 2000s, was physically separated from the mainland, unfamiliar in the popular imagination, and technologically disconnected (figure 2.3).

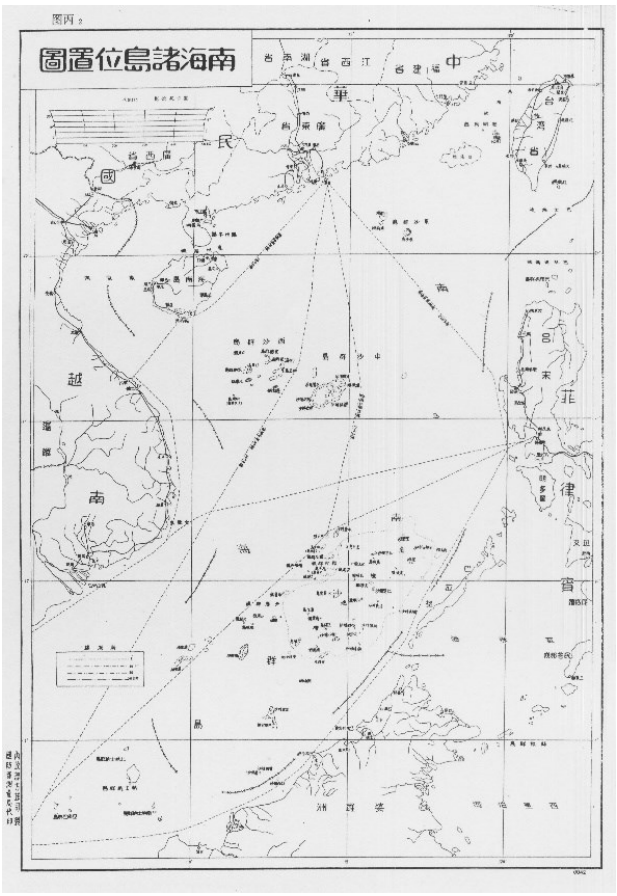

Figure 2.3. 1947 Historical Map of the South China Sea.(Published by the Government of Republic of China). Wiki Commons.

Things started to change drastically in the 2000s. During this period, state investments into telecommunication infrastructure grew rapidly. Satellite telephone services were set up around 2003 and became a key channel of communication for wide-range coverage in the area, despite unstable reception. Following this strategic boost in infrastructure upgrade, the three major state-owned telecommunication companies--China Telecom, China Mobile, and China Unicom--soon started to develop 3G/4G mobile cellular networks that allowed relatively stable Internet connection and communication (China.com 2012). More recently, multiple civil gateways into the South China Sea appeared around the region's ecological features and oceanic environments. For instance, the Chinese government started to allow exclusive reef visits for scuba divers and vacation cruise lines for travel to the Sansha islands (Sohu News 2017). Several operating oil drilling platforms were turned into hotspots for night fishing tours (Diaoyur Blog

2016). These small-scale experiments to "open up" and connect the southern ocean to mainland China did not initially receive much global attention and remained known mostly to specific local communities or national news. However, these small-scale experiments soon gave way to more high-profile land reclamation projects beginning in 2013 (not exclusive to China but also involving the Philippines, and Vietnam). Many of these uninhabited rocks and reefs have been turned into full-size artificial islands over only a few months' time through seabed dredging and construction. Mega island building projects not only drastically changed the ecological environment in the South China Sea (Lawrence and Fan 2016) but most significantly shifted its political landscape by exposing the region to unprecedented media scrutiny, civil and military surveillance. The growing numbers of news footage, satellite images, and popular videos, as I will argue later in the chapter, occupy the center of the political present and future in the South China Sea.

One crucial factor that helps to accelerate this transformation is a growing interest in its complex resource geography. Apart from holding significant fishing and mineral resources for the littoral states, the South China Sea is deeply connected to global networks of energy trade. The Strait of Malacca to the South China Sea is the shortest sea route between Persian Gulf suppliers to the growing Asian markets (Figure 2.4). According to estimates, in 2016 alone, this energy route sustained 16% of global oil and natural gas transportation and brings 16.0 million barrels per day into Asian countries, notably China, Japan, South Korea, and Indonesia (U.S. Energy Information Administration 2017). Yet, the region's political instability and escalating maritime attacks pose continuous threats to global energy security and national energy demand. In this case, the state and corporate interests not only operate together to tighten regulation over oceanic resources, but also to expand transnational infrastructure to bypass the maritime energy choke point.[4] It is thus not surprising that many of the resource mappings are conducted by major stakeholders in energy trade, for instance, state enterprises like China National Offshore Oil Corporation (CNOOC) and PetroVietnam,

[4] The Myanmar-China pipeline is one of the examples. This pipeline transported over 400 billion cubic feet of natural gas per year since 2014 and oil since 2017 from Myanmar's ports in the Bay of Bengal to the Yunnan province of China.

or transnational research institutions such as the U.S. Energy Information Administration (EIA), which have all published resource maps and regional risk reports on the South China Sea.

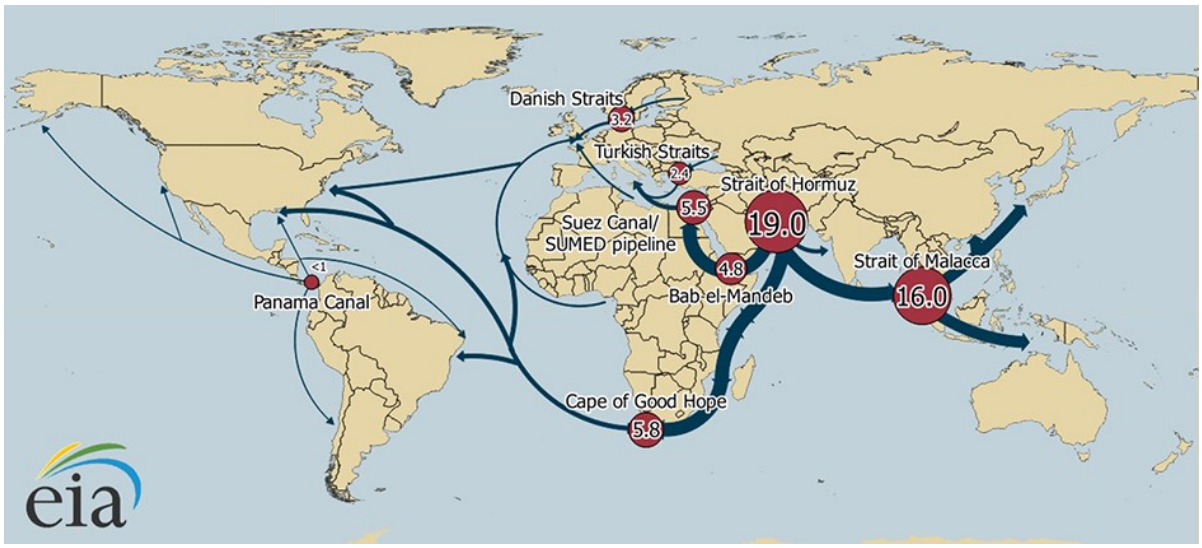

Figure 2.4. Global oil and natural gas transportation map in 2017, published by the U.S Energy Information Administration (EIA)

These oceanic disputes over political borders, economic trade routes, and security are by no means exclusive to the case of South China Sea. However, the South China Sea, as illustrated above and understood throughout this chapter, is an oceanic-island region that is both disconnected and hyper-connected, and thereby this tension of (dis)connectivity must be constantly negotiated not only as a technical issue but as a political and legal one.

It is therefore impossible to re-articulate this intricate relation to connectivity without tracing the global imaginary of the Internet as Ocean. In popular cultural imaginaries in the U.S., the Internet and the ocean are certainly not alien domains but cross paths at a particular historical juncture - the mass commercialization of personal computers and the popularization of the Internet into everyday life in the 1990s. In June 1992, librarian and educator Jane Armour Polly posted a short piece on the Wilson Library Bulletin titled "Surfing the Internet." This non-technical article, according to Polly (1992), was "an introduction to Internet communities and how librarians and libraries can benefit from net connectivity." Her article focused on the volume of information and knowledge, as well

as new modes of active communication through early Internet services such as FTP archive, the World Wide Web, and listservs. During the same year, on 24 Feb 1992, Mark P. McCahill, father of the Internet Gopher protocol, posted in a newsgroup on Usenet, saying, ".... There is a lot to be said for...surfing the Internet with gopher from anywhere that you can find a phone jack....." He later explained that this expression is inspired by his interests in windsurfing, and "extending the 'channel surfing' metaphor to the Internet because we thought that browsing was an important way of finding information" (Polly 2006). Despite their different rationales, both Polly and McCahill pointed to why "surfing the Internet" won over "mining the Internet" and took hold of the popular discourse and imaginary at this early moment of the Internet, from the early 1990s up until the beginning of 2000s. "Surfing" first invoked a popular imagination of cyberspace and the virtual environment as an oceanic surface - a borderless space that is up for exploration, simply with a click of the button. It further mimicked the action of web-browsing and navigating through the vast ocean of information. *The Kids' Guide to the Internet* (Philip Earl 1997) was credited the pop culture classic for this early sense of digital exploration, while "Just surf the net," "hear your fingertips," were associated with cool and youth culture. This popular cultural image of the Internet as "surfing" thus encapsulated the potentialities of the Internet in its first decade, echoing a now well-critiqued utopian discourse of cyberspace - as a deterritorialized space of total liberation of identity and knowledge in the age of globalization.

As many media and Internet scholars already point out, the burst of the Internet bubble in the late 1990s gradually detached the public discourse from this initial moment of techno-utopia to a much more complex narrative (Nakamura 2008; Chun 2006). The utopian borderless cyberspace gave way to the anxiety of regulation, control, and surveillance through Internet protocol and systems. Yet within the shifting popular discourses of the Internet in the 2000s, the oceanic imaginary did not entirely disappear but rather magnified the fear of overflowing data and information, demanding new tactics to govern, manage and re-territorialize the unruly Internet.

If the U.S. formulation of Internet/Ocean indicates a clear shift from deterritorialized cyberspace to reterritorialization of the Internet, the Chinese vernacular usage seems to suggest that they coexist but serve different economic and political ends. In everyday

usage, the Internet ("hu lian wang" as differentiated from "wangluo" for "network") is often compared to the ocean ("haiyang"). The vernacular expression "Hulianwang de haiyang" can be translated literally into "Internet (as) Ocean." The term captures a correlation through their resembling vastness and unpredictability, difficulty to navigate, and the necessity to monitor and regulate. At times, "Internet (as) Ocean" prioritizes the image of the Internet as a smooth surface, capitalizing its economic potential for global communication. For instance, Chinese telecommunication companies, such as China Telecom, refer to their roaming services as "man you," which literally means swimming at your free will in the world of communication. The Internet is thereby envisioned as open and borderless. Other times, the term emphasizes the sheer amount of information and data as a means to legitimate various practices of Internet policing. One key example is China's nationwide campaign in 2009 to regulate "harmful" contents—pornographic, violent and politically sensitive information—by installing the Green Dam software on millions of family computers (Branigan 2009). Even though this crucial image of a dam first invokes an association with floods and a water-oriented imaginary of the Internet, it is nevertheless overshadowed by other metaphors of Chinese digital culture such as "the Great Firewall." The dam is simply articulated as yet another version of the wall, a blockade build by the state in the name of Internet security. Thereby, this vernacular iteration of "Internet as Ocean" both sustains the utopia of a de-territorial and borderless space of communication and a political imaginary of control and governance.

Although this brief account of popular imaginaries of Internet/Ocean is far from comprehensive, it lays out a popular contour that pushes the material geography of the South China Sea into constant contact with the cultural topography of the Internet. But before we can dive into the digital-oceanic environment, it is important to delineate how oceanic politics has long relied on a land-centric framing, which has direct impact on how Internet signals are politicized and imagined at sea.

Territorialization of Maritime Space: Cellular Infrastructures and Signal Sovereignty

"From now on, calling from my cell phone will be much easier!" says a local Chinese fisherman while shaking hands with a technician from China Mobile's network

maintenance team, who just landed in Yongxing Dao (aka Woody Island) in Xisha Qundao (aka. Paracel Islands). This is a scene from "Laizi sansha de shengyin" (The Voice From Sansha) in *Lihaile, Wodeguo / Amazing China* (CCTV 2017), a state-produced series broadcast by CCTV Xinwen Lianbo, the national news program.[5] There is a lot to say about the strong nationalistic undertone in the overall series, but for the purpose of this section, I want to linger on this overtly simple statement about "easy" connectivity. In fact, "The Voice From Sansha" demonstrates the exact opposite to this statement: Making the phone call happen in the remote Xisha Archipelago is anything but "easy." It took decades of hardship for China Mobile technicians to install and maintain the mobile network infrastructures against the turbulent ocean and strong wind so that we can see the smiling faces of residents talking on their cell phones.

While this scene does remind us of the oceanic imaginary of the borderless Internet and roaming services discussed in the previous section, it also points to a different Internet/Ocean dynamic. As I will argue, the oceanic geography and governance is increasingly entangled with both the material infrastructures (base stations, technical labors, and signals) of the Internet and a cultural discourse of everyday connectivity, both of which can be mobilized by nation states, telecommunication companies, and the navy. This also points to a continuous process of territorialization of maritime space, which has been put to work in oceanic politics. To put it differently, if the previous section retraces the vernacular imaginary of the Internet (as) Ocean, this section tries to capture its reverse: how a disputed ocean is reconfigured and territorialized through the Internet. In order to support this argument, I will first take a specific analytical trajectory: I start with the master plan for a networked South China Sea, pointing to several conceptual limitations of this idealized co-constitution of the Internet and the ocean; then I move on to China's recent expansion of the mobile cellular networks across the South China Sea, investigating how both infrastructures and signal connectivity are politicized paradoxically through land/mainland.

There is no better example than the Office for Metropolitan Architecture (OMA)'s master plan to elaborate this potentiality by literally reconfiguring the South China Sea

[5] "Voice from Sansha." Tencent Video. June 20, 2017. Accessed December 12, 2017. https://v.qq.com/x/cover/f8c9rfmuokam369/u0516wm1x5v.html

into an Internet-like mega-regional network. Around 2001, OMA, the Rotterdam-based architectural firm, proposed a provocative future for the disputed South China Sea to Beijing. The OMA blueprint plans to merge the Spratly Islands into a mega-archipelago - an imaginary architecture over the contested territory - would allow different parties, from nation states and oil companies to fishing communities, to share the regional resources despite the unresolved jurisdictional disputes. In Benjamin Bratton's (2016, 5) words, this structure hopes to offer "a kind of oceanic canopy through which the new production and distribution initiatives can draw on the islands' considerable but inaccessible oil and gas reserves, serve the freight, cruise, and sea-steading traffic, and also effectively house the hundreds of new inhabitants to be imported from the mainland."

What differentiates this from other tactics of oceanic governance is a regional, imaginary network of distribution modeled on the early architecture of the Internet. Carving the irregular islands into standardized units and manageable nodal points, this imaginary network is expected to sustain a mega-scale logistics both under and above the sea level "without generating any clear monuments, symbolic icons, and critical choke points in case of external threats and attack" (Bratton 2016, 8). Bratton's account establishes a problematic but valuable analogy between Internet network and ocean governance. As an architect, he sharply accentuates the role of architecture as a technique of exception (Ong 2016), operating alongside and even beyond the sovereign power to manage and extract from a multi-scalar, complex oceanic environment. In other words, OMA's master plan, even though now suspended and no longer accessible to the public, can be read as essentially a state-corporate attempt to reconfigure the oceanic environment into a networked site of extraction, which allows capital and corporate interests to partially bypass the political tension and tap into the regional resource economy and ecology.

This analogy between the architecture of ocean governance and the design of early Internet network is worth unpacking further. The rise of the Internet was deeply connected to military research in the U.S. since the 1950s. The Internet was designed as a solution to the vulnerable centralized military defense system in the face of a nuclear attack. Compared to the previous NORAD system, which was a centralized, hierarchical

system, the early Internet was modeled as a distributed network. The distributed network, as Alexander Galloway (2004, 288) describes, "distinct from its centralized and decentralized cousins, is a specific architecture characterized by equity between nodes, bidirectional links, a high degree of redundancy, and a general lack of internal hierarchy." This early Internet architecture also relied on packet-switching, which allows the overall network to function even if one node is destroyed. We can certainly see some structural resemblance between the OMA blueprint and the Internet network based on generating flexible and manageable nodal points, and the principle of redundancy to ensure network security.

Nevertheless, this idealized analogy of ocean/Internet certainly has its conceptual limitations. First, as Galloway (2004) aptly argues, in the age of the distributed network, control does not simply just disappear but rather operates in new forms. In OMA's case, the structure of the distributed network belies the alleged central point of power and control - a Beijing-funded project that favours China in not challenging their existing sovereign claims and economic interests in the region. To put it differently, its conceptual aspiration to an oceanic "common" - where resources can be shared and maximized - in fact conceals important historical and political processes in the region, such as military modernization, as territorialization of global maritime space, and communication history. These two mega-structures emerge in distinctive geopolitical contexts that need to be taken into account. Bratton did acknowledge the need to account for the geopolitics in which the OMA plan is embedded. He situates himself in the position of Indonesia at the particular historical moment when the right-wing John Frum Party and anti-Chinese popular sentiment was heightened. Marked by popular nationalism as well as the strong presence of U.S. political influence, what this geopolitical "position" reinforced is a familiar discourse produced *for* the region, rather than emerging *from* the region itself. Bratton (2015, 3) summarizes that "the Spratly islands have been turned into a symbol untethered from real geographical experience…but a trembling fear of Chinese regional hegemony, and the physical force thereof." Therefore, to construct a discourse produced *from* the region, we need to sink into the very geopolitical and material contexts, which will subsequently help us to navigate through the multi-scalar anthropogenic activities happening on a daily basis in the disputed water.

This leads to the second conceptual shortcoming of this analogy. The seamless co-constitution between the ocean and the Internet, as presented by OMA, neglects how existing Internet networks actually operate at sea and the kinds of cultural and geopolitical relations they forge. China's recent expansion of 3G/4G mobile networks in the South China Sea thus provides a chance to bring these historical and geopolitical contexts back into studies of Internet infrastructures as well as highlighting how signals and connectivity are imagined and politicized.

Figure 2.5-2.6. China Mobile's signal towers in Mischief Reef (aka Meiji Jiao) in the Spratly Islands. *People's Daily online*, 2015.

Unlike the majority of the global Internet that is sustained by undersea cables (Starosielski 2015), Internet connection across the South China Sea is now mainly integrated into telecommunication infrastructure on the ground. China Mobile first built 22 ground stations surrounding the Hainan Island (the most southern province) in 2001 to enhance the mobile signal strength, which could cover 70 miles offshore and offer communication to local fishermen (Ning 2014). These pan-island signal stations soon were unable to offer coverage for the growing demand of civil and military usage. Therefore, in 2003, China Mobile built the first signal stations on Woody Island (aka.

Yong Xing dao) and then began a wave of infrastructure building across major islands (figure 2.5). These stations mainly operated as the ground infrastructure to receive and transmit cellular signals to both the military and civilians stationed on these islands, or those who passed through nearby waters. By 2008, there were six base stations across the Paracel Islands to serve over 4000 military and civilian users and provide signal coverage over hundreds of sea miles. By 2018, China Mobile announced that the seven base stations were capable to provide cellular/Internet signal coverage across the Spratly Islands.

Paradoxically, reading through public accounts on infrastructure developments, it is impossible to imagine the Internet in the South China Sea without land. The Internet "at sea" needs to be physically rooted across land features - coast, islands, rocks, and reefs, and relies on regional communication satellites.[6] The oceanic geography of Internet moves from the mainland (Hainan Island) to major archipelagos (the Paracels and the Spratly), barely touching the water. The land-centric materiality of the Internet network further manifests in its linguistic basis. The signal infrastructures are called *jizhan* in Chinese, which literally means "base station." At the surface, "Ji" can be understood as a "base" or "foundation," but the written character further emphasizes that these media infrastructures are tied to land and earth. In this sense, the expansion of Chinese communication and Internet networks has not only been "hooked into the cultural geography of islands," (Starosielski 2015, 173) but also reveals a cultural affinity to land. From this perspective, China Mobile's cellular network development arguably re-enforces the centralization of land in the networked South China Sea, drastically in contrast to OMA's bold vision of an ocean-based distribution network.

Furthermore, this land-based Internet network at sea is by no means a purely technical phenomenon but deeply bounded in the political processes of territorialization - the expansion of land-based territorial claims through the Law of the Sea (Oxman 2006; Chubb 2017). What is at stake here, as Truong and Knio (2016, 27) argue, is precisely that various mechanisms of power —nation-states, international laws, telecommunication companies—"have transformed the ocean from a "common" into what holds the

[6] Undersea cable became available only very recently in specific islands and operated as back-up method for emergency communication.

characteristics of a "territory" with multiple claims to sovereignty." These historical processes of negotiating national maritime rights with international law were eventually consolidated as China's concept of "blue territory" (lanse guotu), which literally means "the blue national land." The expression "blue territory" has been used in both official and popular narratives since its first appearance in a 1999 speech by the Minister of Land and Resources Zhou Yongkang (Chubb 2017). It accentuates a normalization of the land-centric logic in China's maritime administration and legal strategy. For instance, the establishment of Sansha City is one direct manifestation of territorializing maritime space. In 2007, China's State Council approved Hainan province's motion to set up the new Sansha City to administer the three major archipelagos in the South China Sea, including Xisha (the Paracel Islands), Zhongsha (the Macclesfield Bank), and Nansha (the Spratly Islands). By incorporating the scattered archipelagos into China's administrative topography, it becomes necessary for the political apparatus to manage the corresponding ocean space. Categorizing Sansha as a "city" despite the fact that most of these archipelagos are uninhabited and undeveloped, further projects a future-oriented imagination of oceanic development that is strikingly similar to its land counterparts.

Building upon these land-centric political and legal developments, Chubb (2017) concludes that "all civil technologies - not only patrol boats, but also fishing trawlers, oil rigs, and even cell phone signals and weather reports - are not merely asserting the state's presence, advancing the national economy, addressing its energy security, or carrying its communication. Rather, they are seen as performatively creating state sovereignty at sea." While I share his sharp argument on increasing territorialized maritime disputes and politicization of civil technologies, how these emerging media technologies at sea, in this case mobile signals, are actually used, imagined and reconfigured by different parties is yet to be fully examined. It is important to note that while China set up official regulation for undersea cable construction and infrastructure maintenance in China's territorial ocean as well as the continental shelves back in 1989 (State Oceanic Administration 1989), until today, there has not been any clear regulation on cellular signal towers at sea or on archipelagos. To some extent, the absence of legal regulation contributes to the unprecedented speed of media infrastructure expansion, but in turn, it also conceals how

the imagination of signal and connectivity is strictly regulated and thus mobilized politically.

As we see from the Sierra Madre incident at the beginning of this chapter, mobile signals' technical operation encounters the undetermined political maritime space at unexpected moments, and its legitimacy shifts depending on your "position" in relation to the sea. Tawil-Souri (2014, 160-161) vividly captures the fuzzy relation between cellular signals and political space, saying "cellular signals by their nature do not 'know' to stop at political boundaries" yet their infrastructure and usages become the material markers of the long-standing territorial disputes and political oppression. Furthermore, cellular signal flows continue to generate new political borders by determining the range of Internet access. These new borders are enforced, as Tawil-Souri (2014) argues, by techniques that are both inherent to the technical system and those imposed by legal and political decisions. In this sense, the emergence of new political borders in the South China Sea is both a result of the technical capacity of signal transmission and a series of state administration and legal decisions.

However, I would add to Tawil-Souri's argument that this conscious use of signal connectivity to forge new political borders also hinges on the popular imagination of mobile signals, often led by telecom companies as well as the Chinese Navy. The development of mobile telecommunication networks in the South China Sea is not only heavily contingent upon various state-led decisions but also influenced by other players. "The Big Three" telecommunication companies: China Mobile, China Telecom, and China Unicom, as well as tech manufacturer Huawei are major corporate investors to upgrade the 3G/4G mobile networks at sea. As the infrastructure moves southward to Nansha (the Spratly islands), the military becomes increasingly present. Both the Ministry of Communication and the Chinese Navy have been actively involved in the construction of new signal towers and island infrastructures in Nansha since 2010 (Shan 2018).

Figure 2.7–2.8. China Mobile's 2005 (up) and 2016 (down) advertisement for providing 3G services to the Paracel Islands (aka Xisha Qundao).

China Mobile's self-representation of the mobile signal offers a good case in point. In 2005, China Mobile released an advertisement for the newly installed 3G cellular signals in several main islands in Xisha Qundao (Figure 2.7). At the center of this advertisement, we see an isolated island surrounded by the crystal blue sky and the deep blue ocean. The island is covered with green plants and shows no trace of human

habitation or construction. Visually, this remote island seems to remain intact among the rapid technological and ecological transformations underway. However, the slogan hovering on top of the island suggests otherwise: “When there are (cellular) signals, our footprint will reach further.” The subtitle below locates the anonymous island as part of Xisha Qundao. As Nicole Starosielski (2015, 173) argues, featuring islands as entities of isolation helps to “justify the unending expansion of networks,” and in this particular case also projects a desire from the mainland to connect remote corners at sea. In other words, the 2005 advertisement clearly establishes a mainland-island relation through mobility of cellular signals, but in fact, the almost romantic imagery of islands ties the Internet signal footprint with territorial expansion at sea.

Almost a decade later, in 2016, another advertisement of China Mobile was circulated unofficially in online forums, right after the release of the South China Sea arbitration. Compared to the previous example, this advert shows a much more direct politicization of mobile signals as maritime authority. We see an aerial photograph in the background, showing a white oval surface that resembles land, and it gradually blends into the ocean. What draws our attention however is the large-font caption at the bottom right, which says: “If it is China's territory, there must be 4G signals.” The smaller font caption below, rather than identifying the featured island, simply states the fact that China Mobile’s 4G signal already covers the seven main islands in the Paracel. The signal footprint in this case not only sustains a similar desire of connectivity across distant islands to mainland China but most importantly has been directly translated from a technical achievement of connectivity to an informal register of political legitimacy.

As another major player in expanding the Internet infrastructures, Chinese Navy presents a slightly different narrative between the Internet and the South China Sea. One of the most frequently referenced articles on the 3G networks featured a collage of smiling selfies of soldiers serving on the Spratly Islands. These selfies were taken right after the installment of 3G networks in the Spratly in 2013, and the photos were sent to their families living on the mainland (Guo 2015). What Internet networks afford in this particular narrative is benign: It is not about national security or fishermen’s safety, but maintaining a “family” connection through everyday media practices - sending a selfie, or video chatting with families living on the mainland. The integration of the Internet and

mobile communication infrastructure is deeply embedded in the daily usage of cell phones by both Chinese military and civilians on the island. Everyday connectivity, thereby, sustains a tangible connection between the isolated island residents and families on the mainland, between the inaccessible islands and the "motherland."

Certainly, this is by no means the only narrative the Chinese Navy produces and distributes regarding the South China Sea, some of which are much more in line with state ideology. Nevertheless, this particular construction of the Internet as connecting family and everyday practices echoes a larger mediated discourse of benign and easy connectivity, like that presented in the opening scene from "The Voice of Sansha." To briefly conclude, this section illustrates a particular trajectory of ocean as "Internet" in terms of material infrastructures, signal transmissions, and imagination of everyday connectivity. The state, telecommunication companies, and Chinese Navy collaborate in politicizing media infrastructures as a form of authority and legitimacy, and this politicization of technology in turn relies on a popular discourse of connectivity as easy, benign, and ordinary.

Looking from the Ocean: Island Fever and (il)Legality at Sea

We have seen so far how Internet signals at sea are, ironically, grounded on land and in the popular imagination of connection with the Chinese mainland. This section starts with a claim that this land-centric principle sustains hegemonic ecological and legal categories that continue to shape the political geography in the South China Sea. In particular, the principle of "land dominates the sea" directs attention to the large-scale land reclamation activities, commonly known as island building.

Rupert Wingfield-Hayes's 2014 BBC report "China's Island Factory" was one of the earliest close coverages of artificial islands in the South China Sea, and it brought the massive scale of land reclamation activities into public view. China is certainly not alone in the frenzied construction of islands on disputed reefs and rocks. By 2015, Taiwan had constructed a small fishing settlement and Taiping Cultural Park on Itu Aba Island, the largest land feature in the Spratly Islands that has access to fresh water. Malaysia stepped into the reclamation race after 2015, constructing vessel ports in the Southwest Clay Reef and Sin Cowe Islands. According to estimates from the Asia Maritime Transparency

Initiative, China's land reclamation projects spanned from Johnson South Reef and Fiery Cross Reef to the Mischief Reef and created about 3,000 acres of new land by 2017, making China the leading player in this island fever. Apart from these man-made islands, the increasing presence of oil-drilling platforms, cargo vessels, and military patrols in the region also constitutes a new dimension of oceanic ecology in the South China Sea.

Building artificial islands on existing rocks and reefs could be understood as capitalizing on the land-centric logic embedded within practices that recast legal authority over maritime spaces. Legal scholars and political scientists have identified how international laws over ocean rights gravitate around the grounding principle of "the land dominates the sea." This principle is a result of the postcolonial negotiation of global oceanic sovereignty. Global territorialization of maritime space can be traced back to the formative years of the United Nations' Convention on the Law of the Sea (UNCLOS), which ultimately managed to "subject nearly 50 percent of the world's oceans to land-based claims of state jurisdiction" in the 1982 meeting at Montego Bay (Chubb, 2017). As a latecomer to the imperial game of island grabbing, China quickly followed UNCLOS's land-centric strategies and 'grounded' its maritime sovereign claims in policy or legal documents, such as the 1996 China's Maritime Agenda for the 21st Century (*Zhongguo Haiyang 21 Shiji Yicheng*) and the 1998 Law of the People's Republic of China on the Exclusive Economic Zone and the Continental Shelf. Political processes of territorialization, or what Oxman (2006) has called "the expansion of land-based territorial claims seaward," not only have been institutionalized in international and national laws but have also manifested materially as land-based Internet infrastructures in both the region and the man-made islands.

However, under the current Law of the Sea, these emerging artificial structures are perceived as para-legal or illegal entities and do not hold any substantial maritime rights and political power. This *externality* to international law and sovereignty at sea is repetitively captured as a matter of ecological categorization: "Are they islands, rocks, or reefs?"—a problematic framing that hinders our understanding of these new structures (Asia Maritime Transparency Initiative 2015). Part of the current uneasiness and inability to make sense of the proliferating artificial structures (including man-made islands, oil

drilling platforms, and human settlements) comes from this ecological-legal framing, and the fact that it is enforced as a universal understanding of legality.

According to the Law of the Sea, legal entitlement to territorial water is determined by ecological features, which are subjected to both quantitative measurements (e.g. tide cycles and land sizes) and qualitative evaluation (what it means to be "capable of sustaining human life").[7] In addition, while the state can exercise sovereignty over its entire land territory, it holds "graduations of jurisdiction" depending on the ocean's relation to the state's land territory (Butcher and Elson 2017, xxi). For instance, the state holds the same sovereign power over "internal waters" (river mouth, bays) as its land territories because these waters are partially enclosed by land; for "territorial waters," which extend up to 12 miles, the state has sovereignty yet yields the right of "innocent passage."

The intention here is not to dive deep into the legal literatures but to emphasize how this insistent differentiation of land and sea as ecological and legal entities has direct political consequences. The coast thus serves as a legal site and a metaphorical "baseline" to think about issues of territory, legality and sovereignty.[8] As the legal scholar Davor Vidas asserts, even though the proliferation of artificial structures is essentially a result of the development of the Law of the Sea, the legal framework simultaneously denies them any status and thus (the islands) do not "affect the delimitation of the maritime zones such as the territorial sea, the exclusive economic zones or the continental shelf" (2016). In other words, international laws such as the Law of the Sea normalize and institutionalize an ecological-legal construction of maritime rights that is now commonly

[7] According to the Law of the Sea (UNCLOS), there are three different ecological land features in territorial waters, each corresponding to legal entitlements and territorial rights, and they are:
1) low-tide elevations, a landmass that is not entitled to any special economic zones;
2) rocks, a permanent land mass above water but cannot hold human habitation, and it entitles a 12-nautical-mile territorial sea but no special economic zone.
3) islands, capable of sustaining human habitation and economic life, can generate an exclusive economic zone (EEZ) of 200 nautical miles and a continental shelf.

[8] The concept of a "baseline," from which "various maritime zones of sovereign rights and exclusive jurisdictions are determined," (Vidas 2016) precisely animated this imposed ecological differentiation so as to exercise legal authority. A "normal baseline" is defined under the Law of the Sea as "the low-water line along the coast as marked on officially recognized, large-scale charts or the lowest charted datum" (NOAA 2017).

accepted by the majority of nation states and has become the dominant understanding of political legitimacy.

Nevertheless, Vidas also posits that we are facing an epochal moment "when the sea begins to dominate the land" (2016). What he is referring to here is that, in the age of the Anthropocene and ecological change, the legal baseline is challenged by the unforeseeable oceanic environment. Both rising sea levels and seashore dredging materially change the coastal features, and they also shift the maritime baseline that has been delimited according to existing international laws. The institutionalized oceanic laws are incapable of accommodating both anthropogenic and ecological transformations. Even though his main concern is maintaining the effectiveness of the international laws of the sea, I want to take up his provocation that 'the sea dominates the land' and further ask: What does it mean to resist the "territorial temptation" and look from the sea as a "zone of indeterminacy" where institutional rights and ownership reach their limits (Heller-Roazen 2009)?[9] How does an ocean-based methodology change the way contemporary digital and political geography is mapped?

Taking these issues together, the Internet/Ocean puts forward a conceptual space to understand two entangled forms of (il)legibility. While the artificial islands are ineligible to institutionalized form of legality, Internet-based videos are illegible to mediations that are more politically recognized, such as satellite imaging. By putting these two in conjuncture, we might argue that video's specific mediation offers a potential digital space to negotiate artificial islands' problematic "legitimacy." Methodologically, this first signals the significant analytical shift that drives this chapter: from land-centric to more ocean-based framing to understand the region's legal, cultural and political contingencies. Second, the sea-bound perspective is not simply restricted to the ocean itself, but conceptualizes it more broadly as not legible to institutionalized

[9] In his account of the Roman law, Daniel Heller-Roazen uses the term 'littorum' to capture a fluctuating realm where land meets the sea, where civil law ends and natural law starts. He notes, the shore may not be an autonomous legal entity but it is subject to its very environment, a public domain determined not by "the extent of territory but by the shifting movements of water" (Heller-Roazen 2009, 64). The littorum, or the shifting shore, thus constitutes a different formation of legality in which changes of the oceanic environment is essential than excluded as in the case of the baseline.

forms of mediation and legality. It is precisely the institutionalized framing that hinders a critical examination of the cultural and political transformation at sea.

Rather than situate my analysis under the narrow sense of legality set by international laws, I take up this oceanic perspective as essential for examining the contested mediation of the disputed South China Sea. This approach to "looking from the ocean" does not impose an ontological division between the territorial and the oceanic. Instead, I emphasize that it should be conceptualized broadly as different articulations of this fuzzy realm of legality, paying attention to entities and practices that fall away from institutionalized, normative forms of legality and digitality.

Videated Populism: *South China Sea Arbitration, Who Cares?*

The 2016 *South China Sea Arbitration* encapsulates the complex legal dynamic outlined above and offers a glimpse into the intricate relationship between popular videos and political discourses at sea. In 2013, the Philippines initiated an arbitral process under the Law of the Sea. They requested a reassessment of certain maritime features and their legal entitlements, claims by historic rights, and the lawfulness of recent Chinese land reclamation activities. The Philippines emphasized that their intention was not to seek "a delimitation of maritime boundaries" (Kotani, 2016).[10] Instead, this motion requested a ruling over the *legal status* of certain maritime features and human activities that have been at the forefront of the Philippine-China tension over the South China Sea. In their press release, the PCA similarly accentuates that this arbitration does not "rule on any question of sovereignty over land territory and does not delimit any boundary between the Parties," given its juridical limitation (Permanent Court of Arbitration 2016). After multiple hearings in 2015, despite China's refusal to participate in the process, the Permanent Court of Arbitration (PCA) published the South China Sea Arbitration in 2016.

[10] In their press release, the PCA similarly accentuates that this arbitration does not "rule on any question of sovereignty over land territory and does not delimit any boundary between the Parties," given its juridical limitation (2016).

One of the major pressure points in this arbitration is to re-emphasize the ecological-legal categorization from the Law of the Sea as the main rationale for settling maritime disputes. The arbitration concluded that the land features currently claimed by China, in their natural conditions, can only be categorized as low-tide elevations or rocks and thus are incapable of generating an exclusive economic zone. Even though the SCS arbitration is not an international legal ruling nor have the ability to delimit territorial boundaries, according to such ecological reassessment, it denies any EEZ entitlement to the sea areas that they currently construct upon, and affirms that these Chinese-claimed territories, in fact, fall within the EEZ of the Philippines. At the same time, the arbitration denounces any legal authority to historic rights. As stated in clear terms: "[...] China had historic rights to the resources in the waters of the South China Sea, such rights were extinguished to the extent they were incompatible with the exclusive economic zones provided for in the [UNCLOS] Convention" (Permanent Court of Arbitration 2016, 1). To put it differently, the PCA arbitration stated that the Law of the Sea and national historic rights are not only incompatible, but they extinguish each other's legitimacy and ownership over the sea. In short, this arbitration demonstrates an institutional refusal to engage with the ecological transformations and political contingencies brought forth by these artificial islands and other man-made structures in particular.

Figure 2.8. Screenshot of the Communist Youth League's Weibo account, which posted the Nanhai video on July 12, 2016.

Much of the subsequent public discussion revolves around the "lawfulness" of the ruling and its future effect on regional dynamics. Shortly after the release of the 2016 SCS arbitration, the Chinese government issued an official statement that they would not recognize or accept the arbitration. The Internet then quickly became the first point of encounter between the nation-state, the disputed maritime rights, and Chinese citizens. The controversial arbitration quickly unfolded into sporadic popular events on the Internet. An online campaign was launched to boycott products imported from the Philippines, such as bananas, and it soon turned into shaming small businesses on Taobao that continued to sell imported food from the Philippines. It was in keeping with nationalist sentiments across the Internet that the video *South China Sea Arbitration, Who Cares?* (*Nanhai Arbitration, Who Cares*; or, '*Nanhai* video') was published. On July 12, 2016, the video was posted by the Communist Youth League's official Weibo account (figure 2.8). Since then, it has been widely circulated across Chinese social media sites and picked up by a handful of Western media outlets as populist responses from Chinese citizens (Williams 2016). The *Nanhai* video in some ways does echo the rise of popular nationalism and right-wing discourses on the Chinese Internet (e.g., the '*Wumao dang*' or '*Xiaofenhong*' phenomenon). However, I shift the focus to the specificity of this popular video and ask what happens when a legal subject enters everyday life and media practices, in this case when a territorial dispute in the South China Sea enters Internet video production.

Writing in the context of intellectual property, legal scholar Lawrence Liang also addresses this tendency of transferring legal discourse into the cultural realm. He argues that when intellectual property is transformed from a legal subject to a topic in daily conversation, this transformation indexes "an aggressive expansion of property claims into every domain of knowledge and cultural practices" (Liang 2009, 6). In a similar vein, just as territorial sovereignty is transformed from a legal dispute into an everyday topic, certain notions of "rights" and "territories" bleed into popular knowledge and media production. China's political claims in the South China Sea—historic rights, sovereignty, resource entitlements—aggressively expand into the domain of Internet space and generate images of the populist attestation to China's unconditional sovereign authority in the region.

This tendency, I argue, manifests itself through the video's deliberate mixture of selfie-style aesthetics and the ambivalent mobilization of TV and aerial footage. The *Nanhai* video opens with an uplifting electronic beat, which runs throughout the one minute and thirty-nine second video. In the opening shot, a military-looking man with a dark green tank top and a crew cut stands in front of the administrative map of China and talks to a cell phone camera. Viewers can clearly hear his voice saying, "Nanhai Zhongcai, Who Cares?" But the brief moment of silent mouth movement before the audio cuts in seems to suggest that this dialogue is cut from its original context—a longer monologue that is unknown to viewers. Right after this opening shot, the video continues with multiple short sequences from different individuals, each repeating the same out-of-context slogan. We can infer that these sequences are captured by laptop or cell phone cameras because of the block outs on both sides of the screen. This 24-second segment features individuals, including young university students and middle-aged, white-collar workers. The use of everyday settings, including sports fields, school dormitories, family living rooms, and offices, also enforce the impression of "public opinions" from ordinary citizens. It is safe to guess that few of these "ordinary" citizens have ever visited the South China Sea or closely follow the political and legal tensions. However, not only does the close framing of the selfie create a particular *intimacy* between the video and the viewer but it also narrows the visual and emotional distances between a legal issue and an everyday performance, between territorial sovereignty and media production/consumption.

This blurred boundary between legal disputes and everyday performances, between physical access and media consumption for ordinary citizens is quickly interrupted by the next sequence, which foregrounds the militarization of the South China Sea. This sequence drops the viewers directly into the heart of the disputed ocean, and it cuts across several aerial images of unidentified islands without any contextualization. With its low-resolution and deliberate erasure of contexts, viewers can barely identify what they see. One might speculate that the images were originally shot by cameras on Chinese military aircraft, but there is not much indication of where and why these images were taken. At times, the partial logos that appear on the top left corner imply that they might be recorded from television news footage and remediated into the video later on.

What immediately follows is a fast montage of various military equipment (aircraft, vessels, bases) as well as moments of military drills and operations—ocean patrolling, preparing aircraft to launch, and pilots in the jets. But viewers are once again left in the dark about the sources and specificity of the images they are watching. Such visual ambivalence and uncertainty, I argue, is by no means accidental. It creates a sharp contrast to the clear political message delivered in the previous sequence—"we don't care about the arbitration." In fact, the context-less footage delivers a rather different message: maritime rights, even vaguely defined and identified (as in these aerial images), are enforced by an absolute authority through military power. This is certainly not a new statement, given China's increasingly ambitious agenda to extend the land empire into the ocean. Nevertheless, it is worth noting that in this video, there is a strong tendency to reconfigure maritime authority, on the one hand, through circulating militarized and highly masculine visual fields, and on the other hand, asserting it as part of the people's voice highlighted in the previous selfie sequences.

To some extent, the last montage sequence then consolidates these two previous dynamics: politicization of everyday media engagement and militarization of maritime authority in regional disputes. In contrast to the two sequences analyzed above—civilians self-recording patriotic slogans and the montage of masculinized objects and movements—this sequence puts both visual strategies at work, and further mobilizes a particular formation of femininity and cuteness to soften the ultra-masculine militarism. As the screenshots illustrate, the video now cuts between two kinds of shots: One features headshots of cute young girls with animated filters who are repeating "Nanhai Arbitration, Who Cares?" The other captures moments of military attack or weapons testing—missiles launching from vessels, aircraft bombings. The former deliberately uses "cuteness" to feminize and ease the tough position China holds on the sovereignty of the South China Sea, while the latter projects a familiar masculine militarism across other official military videos. The juxtaposition between the video's mediation of femininity and the ultra-masculine militarism is deliberately mobilized. But, in this case, it is less about feminizing or softening China's tough position on the sovereignty of the South China Sea. Rather, the masculine/feminine visual fields signal a friction between everyday media production and the state's assertion of political legitimacy. To put it

differently, everyday media practices (such as selfie-videos and applying beauty filters) illustrate one style of populist intervention into a highly guarded political field (the South China Sea territorial debate) but they do not necessarily concur with the state's proposed discourses in military power.

Figures 2.9. Screenshots from the final montage sequence that cuts between missile-launching and cute young girls' selfies with animated filters. Video "South China Sea Arbitration, Who Cares?"

Up to this point, I have illustrated two things: First, the ecological-legal framing established through the Law of the Sea is precisely what generates a set of political, economic and cultural anxieties over the proliferating "artificial" structures in the South China Sea. In the 2016 Arbitration, the legal indeterminacy put different forms of mediation in friction with each other as an attempt to negotiate the extra-jurisdictional status of the artificial entities. Second, popular media increasingly plays a leading role in addressing, if not negotiating, legal indeterminacy over the South China Sea archipelagos. The *Nanhai* video in particular opens up a more complex mechanism at work, not only through its relationship with the state apparatuses but also when assessing them as sets of media practices with distinctive visual styles and strategies. The carefully orchestrated visual fields—from intimate selfie, aerial photographs, to television—

arguably allow these illegal structures to be articulated and re-enter the broader legal and ecological debates, gaining political leverage in the region. However, despite the increasing significance of video culture in the South China Sea dispute, popular videos are yet to find a "legitimate" place in both Asian media studies and the analysis of political geographies. The following section will situate this difficulty further within the broader visual fields and knowledge productions of these disputed waters.

Video as Anti-Satellite

As illustrated previously, the opacity of disputes over the South China Sea determines the *centrality* of mediation in unpacking the current cultural and political reconfiguration. The dazzling speed and scale of the island building generates an overwhelming amount of visual materials: satellite imaging, UAV aerial photographs, TV news footage, and citizen videos. However, these often-contested visual materials are distributed without differentiation, and thus push aside the political hierarchy embedded in the process of knowledge production and media practice. Furthermore, these artificial architectures on the artificial islands are perceived as material extensions of the nation-state's territorial claims and military power, regardless of what kinds of infrastructures they actually are—technological (signal towers, solar panels, windmills), military (ports, airstrips), or civil (hospital, residences)—or how they are allowed to be seen. Therefore, within this conflict over oceanic territory, the production of media fields—what and who is allowed to be seen, and the conditions in which these fields of vision are produced and distributed—dictates hegemonic relations between human activity and ecological transformation, between national sovereignty and corporate interests at sea.

What is at stake here is that these contested mediations are selectively mobilized for different political purposes. Visualizing the artificial islands can benefit specific national interests – for example China's sovereign claims over disputed islands and oil companies' right to explore in the territorial seabed. Yet transnational players can similarly manipulate the visual regime to legitimize their on-the-clock surveillance and political authority over a distant region. Central to this digital-maritime topography is the tension between normalization and institutionalization of satellite imaging and the speculative mediation offered through videos. Google map perhaps offers a telling

example of how satellite imaging constitutes a default and common-sensual knowledge of the South China Sea. When we search for these disputed archipelagos, in regular view, the Spratly Islands are nothing more than a handful of scattered white spots on a smooth blue surface. If you keep zooming in, you only end up seeing whiter than blue, until a point when an empty white surface occupies your entire screen. Once we switch to the Google satellite view, the visual field itself tells a different story. The oceanic surface is no longer smooth but turbulent, filled with layers of uncertainty. Upon this bumpy blue canopy, supposedly referring to the uninhabited South China Sea, the islands jump out awkwardly as blocks of image pixels. With the help of military-level, high-resolution satellite images, the island ground structures can be zoomed into the smallest details but also seem entirely disconnected to the simulated oceanic environment. Rather than questioning this obvious visual disjuncture, satellite images are mediated through other digital interfaces and most importantly integrated into commercial mapping services and can be accessed through ready-made location data.

In this Google search experience, the ease of zooming in and out conceals as much as it reveals, and speculates as much as it confirms. As Lisa Parks (2001, 589) notes, when technological visions are practically intervening into every domain of life, the important task is to "demilitarize military perspectives, to open the satellite image to a range of critical practices and uses." How did satellite imaging services convert speculations into "evidences?" What happens when militarized satellite images are re-converged into a commercialized digital service and everyday media practices? Following Parks' provocation, I question the authority and truthfulness granted to the technologized satellite visions, particularly through Asia Maritime Transparency Institution's island tracker project. In doing so, I further propose that the videos' particular technical and aesthetic intimacy to the sea should be seen as significant sites to make sense of the political contingencies in the South China Sea dispute.

Satellite data and Automatic Identification Systems (AIS) have become increasingly crucial in tracking the South China Sea disputes especially after the controversial island building. AIS has long been used in monitoring maritime traffic and is a vessel requirement,[11] but the terrestrial-based AIS has its technological limits

[11] Ships of 300 tonnes or more in international voyages, cargo ships of 500 tonnes or more in

because “the Earth’s curvature limits its horizontal range to about 74 km from shore. This means that AIS traffic information is available only around coastal zones or on a ship-to-ship basis” (European Space Agency 2016). As such, traditional terrestrial-based AIS is unable to keep up with the demand of surveillance and tracking the large scale island building activities that began in 2013. While the shift to satellite-based AIS might have initially started as a technical issue, satellite imaging quickly dominated the visual knowledge production of the South China Sea. This is partially the result of commercialized satellite services and data collection. Satellite imaging services, such as *Digital Globe* and *Airbus Defense and Space*, actively track military and civilian activities in the South China Sea, producing images that are often restricted and only for national security use. These satellite images have been integrated into part of our everyday media practices through commercial Internet services such as Google Earth. Moreover, they are not only considered as open-source intelligence for regional disputes but also circulate as “evidences” of China’s progress in land reclamation in global media coverage.

Figure 2.10. Screenshot of AMTI island tracker database

The establishment of the Asia Maritime Transparency Initiative (AMTI), a para-national research institution operating under the Washington DC-based nonprofit Center

local waters and all passenger ships irrespective of size are mandated by the International Maritime Organization to carry Automatic Identification System (AIS) equipment.

for Strategic and International Studies, signals this broader trend in pushing the gated South China Sea into public debates. Collaborating with corporate satellite imaging services, AMTI stands at the crossroads of governmental, corporate, and security efforts to transform militarized oceanic geographical knowledge into everyday media practices. *Island Tracker* is among the most important projects initiated by AMTI, and it aims to track the ecological transformation and progress of land reclamation across the Spratly Islands by China, Taiwan, Vietnam, and the Philippines. The tracker uses a series of satellite images and aerial photographs to present a linear transformation of certain coral reefs, from their natural condition to their current states as artificial islands, potentially holding civil and military infrastructures. These serial satellite images are juxtaposed and shuffle between overviews of the whole islands, close ups of unidentified island structures and vessels, and images marked with arrows and labels. The islands' ecological transformation is most stunningly marked as a spatial disorientation through its shifting color scheme. For the undeveloped reefs, the multiple layers of green and blue shades immediately situate these islands in close relation to the water. The emerging yet unidentified artificial infrastructures, on the other hand, are marked by a monotonous white surface scattered with gray stripes and black dots. The artificial infrastructures in these images are usually disproportionate in scale and constructed as *alien* to the natural, oceanic environment. The "island tracker" in this sense speaks to the larger military and civil efforts, eagerly identifying the political meaning of the black dots and gray stripes.

Furthermore, the particular ways in which these images are organized into "a series" or "a track" in fact erases the institutional and political conditions within which these images are produced, circulated, and why they are solicited and arranged in this way. The fact that satellite images of the South China Sea are presented in unspecified fragments produces more *speculation* than *evidence.* More often than not, these images are referenced out of their immediate contexts. Technologically, viewers are unaware of whether an image is produced by a commercial or military satellite, patrolling aircraft, or UAV. It is also extremely difficult to pinpoint precisely which island is captured in the image and when exactly it was produced. The ambiguity of how mediation happens not only conceals the process of filtering through various governmental, military, and

commercial institutions but also gestures to the obscure political agenda through an orbital view of the disputed islands.

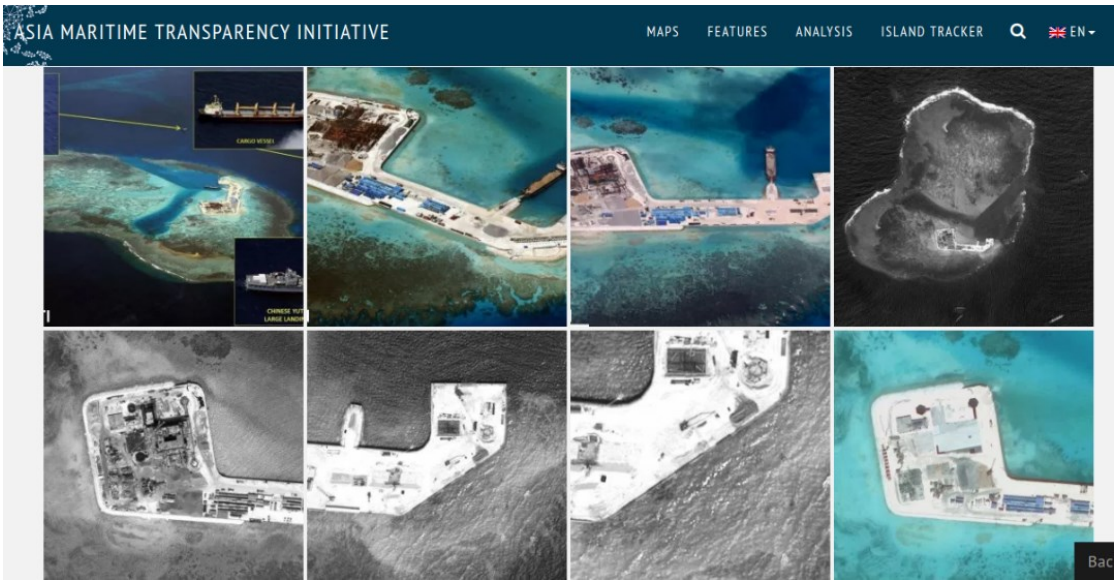

Figure 2.11. Screenshot of Island Tracker - Johnson South Reef (partial)

The screenshot above presents part of the visual tracks for the Johnson South Reef (aka. Chi Gua Jiao), offering an example of the attempt to construct a friction-free, linear temporality despite the disparity in the aesthetic, infrastructural, and political features embedded within these satellite images. Even though the website specifies the particular date when this image was taken, these eight serial images are clearly marked by different aesthetic and political traces. On the top left, the aerial overview of the island is marked-up in great detail—direction, specific types of vessels (cargo, construction), precise name and number of the Chinese landing ships, and institution logos "CSIS/AMTI." Even without knowing who made them or when these markers were made, we can infer that this aerial image can be easily circulated within different media and political narratives by news coverage outlets. Other images in the series, however, display a more ambiguous relation to each other. The contrast from black-and-white to color images is by no means an aesthetic choice, and it indexes the different image sources—they are likely to be taken by satellites owned by different countries and institutions and some older models are not equipped with color cameras. The missing logo also indicates that some of these

images come from external sources rather than those produced and owned by the CSIS research institute. The fourth image on the top, in particular, seems out of place in the "tracks" given its aesthetics of abstraction; it does not resemble reality. As Lisa Parks (2001, 589) argues, these "aesthetics of remoteness and abstraction make its status as a document of truth very uncertain and unstable and open it to a range of possible interpretations and political uses." Constructing a linear narrative of ecological transformation through abstract satellite images of artificial islands, transnational institutions such as AMTI actively produce, distribute, and normalize political authority and geopolitical power animated through technologized vision. In this sense, the technological capacity of high-resolution mediation constitutes an integral part of regional authority in the South China Sea.

Let's turn to a slightly different dynamic to the views from orbit, returning to some of the early media speculations on what exactly China is building on those islands**.** On board a small Philippine fishing boat, the BBC journalist Wingfield-Hayes was "on the hunt for the Spratly islands," in the news documentary *Flashpoint: South China Sea* (2014). This "hunt" for the artificial islands hinges on a discrepancy between what is shown on his GPS and what he sees through the camera. He describes the perceptual discrepancy in a poetic way, "As we get closer, to my right, I am sure I can now see something pale and sandy beside the platform. 'That looks like land!' I say. It can't be. I look at my GPS. There is no land marked anywhere near here, only a submerged reef of the Spratly Island chain. But my eyes are not deceiving me. A few kilometers away I can now clearly see the outline of an island" (Wingfield-Hayes 2014). His vivid descriptions are juxtaposed in a short sequence in which the camera cuts between close-up shots of multiple GPS interfaces on board, such as the GPS panels on the boat, GPS systems on his old Nokia cell phone, and medium-sized zoom-in shots of the alleged "island" in the distance.

On the surface, this brief techno-encounter certainly highlights the contested mediation generated by recent land reclamation activities in the Spratly Islands. On the one hand, there are multiple GPS interfaces—a form of mediation through satellite signal transmission and geolocation data that offers a precise simulation of the geographical environment that might be taken as fact. On the other hand, there is the technologized

human eye, through the video camera hesitantly zooming in and searching on the horizon for the island "that is not supposed to be there." What is intriguing in Wingfield-Hayes's narration and the video editing, however, is the level of certainty and authority given to intimate encounters animated by video over the highly technologized satellite view: "I am sure," "my eyes are not deceiving me." His affirmative tone creates a sharp contrast to the shaky video camera moving along with the waves, as if it is unsure what it is capturing.

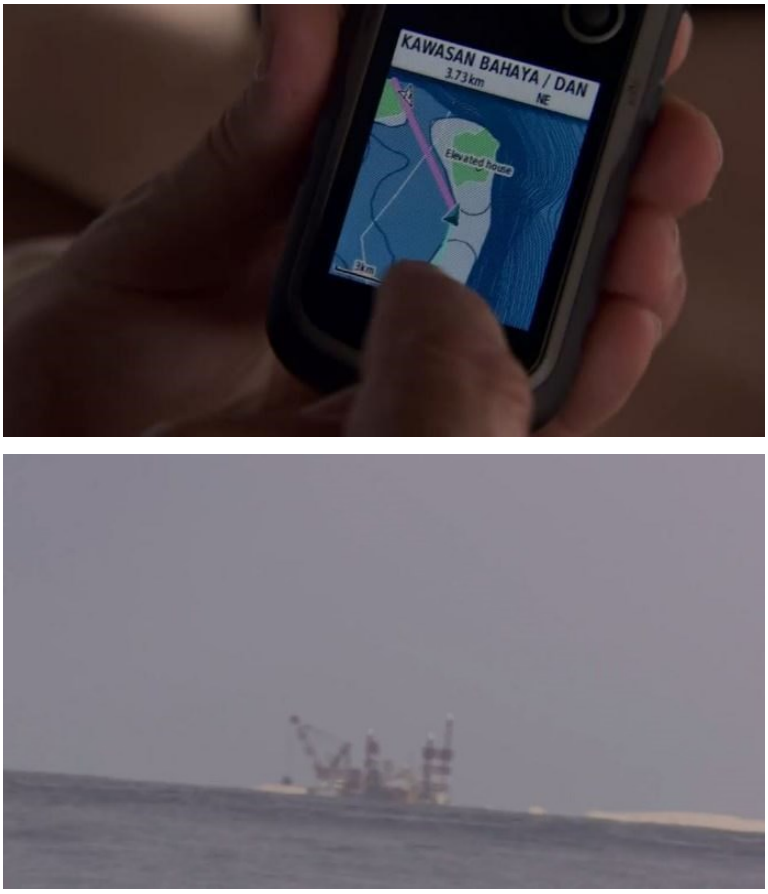

Figure 2.12-13. Video screenshots: GPS interface on mobile phone and video camera zoom-in to islands. Rupert Wingfield-Hayes, *Flashpoint: South China Sea*, 2014

Comparing the Island Tracker and the BBC journalist's island hunt, I hope to emphasize that video occupies a distinctive methodological and analytical position at sea that is sidelined by a dominating paradigm of visual analysis regarding oceanic disputes. Methodologically, while perceived as a less legitimate form of mediation in contrast to institutionalized satellite images, video ironically works as one of the most practical and

accessible forms of mediation during moments of disputes or direct confrontation in the South China Sea. This is particularly the case in confrontations between Southeast Asian fishermen and Chinese maritime patrols, which I will illustrate shortly. Video also calls for an analytical position contingent not only to its technological and formal specificity, but also to its affinity with oceanic transformation. In the above example, for instance, the journalist capitalizes on video's capacity to take us physically closer to the alleged islands, and subsequently to challenge the visual and political authority once granted to satellite images. Furthermore, visually we follow the video camera, moving frantically along the turbulent ocean and speculating on the nature of these material traces alien to the environment. This aesthetic affinity with the moving waves are by no means accidental but repetitively used across video's particular mediation of the disputed South China Sea. Joshua Neves (2017) proposes the term "videation" to signal various forms of material and imaginary intimacy through video's unique mediation. In the case of the South China Sea, videation animates a formal resemblance across the turbulent water waves and modes of mediation, but most importantly an imagined intimacy between legal indeterminacy and everyday media practices. Recalling the previous example of the Nanhai video, for Chinese citizens thousands of miles away from the disputed islands, video's accessibility generates less physical contact than emotional and political intimacies with the distant ocean. In short, While for Neves, "videation" as a concept foregrounds popular media practices excluded by hegemonic notions of digital modernity and globalization, my intention is to highlight video's technological and formal linkages to *speculation* and to push against a broader political imagination often determined by commercialized datafication and high-res mediation of the ocean. As shown in Wingfield-Hayles' videated encounter with the artificial islands, videos animate a formal resemblance between the turbulent water waves and the political uncertainty, but they also animate an imaginary intimacy between legal discourses and popular speculation on artificial structures.

The *Binh Minh 02* video filmed by Vietnamese civilians further pushes these intimacies to an extreme level and enacts a literal confrontation between China Marine Patrol and a Vietnamese survey ship. In 2011, the PetroVietnam survey ship Binh Minh 02 was conducting surveys within the Exclusive Economic Zone of Vietnam defined by

the Law of the Sea. During its journey, it encountered a Chinese marine surveillance ship, which was accused of "cutting their exploration cables and violated Vietnam sovereignty" *(Voice of Vietnam*, 2011). Immediately following this incident, the Vietnamese news outlet Petro Times released a video titled "Chinese ships violate Vietnam sovereignty."

From a distance, the video captured *Binh Minh 02's* standoff with a Chinese maritime surveillance vessel. At the beginning of the video, the camera was set on board *Binh Minh 02*, presumably operated by the captain or one of the crew members. Without much context, the camera quickly zoomed in and located a suspicious vessel in sight. The captain's voice-over abruptly cuts in a second later, announcing "OK, he [the vessel] is coming back," as the unsteady camera tries to keep the vessel in focus. But the frame is staggered due to the turbulent movement of the ship, unable to visually pinpoint its identity. The captain then clearly identifies the hostile vessel as "Zhongguo haijian #84" (a Chinese marine surveillance vessel), but visually the video struggles to zoom in further and adjust its focus. A few seconds later, we finally get a legible visual of the name on the body of the ship, confirming the captain's previous commentary. He continues and sends a warning toward the Chinese vessel: "You are acting very stupidly and dangerously. Stay away from the cable. Stay away from the cable." The repetitive call to "secure the cable" creates a visual expectation of seeing the act of cable destruction, but instead, the camera continues to zoom in and lingers on the ship's logo "Zhongguo haijian #84."

Figure 2.14. Screenshot from video "Chinese ships violate Vietnam Sovereignty." *Petro Times.* 2011.

In this short opening sequence, we already get a sense of the discrepancy between confrontational actions in disputed ocean territory and their videation, which allows us to see it up close technologically while it remains aesthetically ambivalent. On the one hand, the video's zoom-ins generate a technical intimacy both at the site of the incident and during the process of viewing it; on the other hand, the particular aesthetics of videation do not directly register an immediate political standpoint but rather work together with external commentaries to do so. This parallel construction continues to operate in the video. The camera then follows the captain's question, "do they have anything behind?" and slowly pans right, attempting to capture an answer at the back of the ship. But the turbulent movement of the ship hinders a stable visual through the camera, as we see the camera aimlessly moves back and forth along the hostile vessel, searching for any material traces of the cable cutting or hostile action. The search ends in vain as the viewers are left with fragmented parts of the vessel and accidental shots of the moving ocean, and the voice-over (very likely from the person filming) agrees with the camera and says, "uhm...cannot see." However, we can argue that the video camera here in fact did 'see' more than the voice-over—it captures a speculative visual field that is open for populist interpretations rather than creating an enclosure.

While the viewers are never able to locate the cable or see the act of cable destruction visually, the video abruptly cuts to a different sequence. At first glance, in this footage we are unsure whether we are still on board the *Binh Minh 02* or at a different location. Visually, the camera maintains a medium-shot with a blurry white object in the distant water. We can only assume that this is the same Chinese surveillance vessel we saw a second ago as the camera panned horizontally. It is as if the hasty camera movement itself might prove that the Chinese surveillance vessels continue to move back and forth, attempting to cut the cables again, as indicated in the video caption. What really grasps our attention here is the sound of strong winds at sea, the engine noise, and the moving waves that clearly stand between us and the speculated act of destruction. A few second later, an awkward slide-show transition brings us on board the *Banh Minh 01* and *Van Hoa 379*, two vessels sent to inspect and maintain the damage. According to the video caption, the Chinese marine surveillance vessel managed to cut through the cable but when they returned to cut it again the cable's emergency system forced it to sink 40

meters deeper. Here again, the video is unable to demonstrate these physical actions in dispute (cutting, traversing, sinking); it only shows the Vietnamese crews on board looking into the alleged sites of conflict at sea.

By going through this video at length, I mean to showcase the significant role of video, at both its technological and aesthetic levels, in facilitating a nationalist construction of legal conflicts at sea. What has been mediated in the above example is a series of political tensions between: China's military presence and the regional energy security, Vietnam's sovereignty, and China's political activities. These tensions are mediated through potential yet speculative disruptions, such as the physical 'cutting' of the seismic exploration cable. This correlation is certainly not accidental and continues to be found in other small scale, regular confrontations—other cable disruptions, fishermen detained for fishing in disputed waters. In fact, it is arguable that it does not matter that we did not see the conflicts clearly or are never able to identify the cable or the hostile vessel. The visual ambivalence delivered throughout the video strengthens the broader discourse regarding the Chinese violation of neighboring territorial waters in everyday actions. As such, these amateur-style, speculative videations continue to be produced, circulated, and repurposed by at risk populations (fishermen, coastal inhabitants, crew members of oil companies), allowing them to cut into the politicized water in which their voice would otherwise be drowned out.

Conclusion

By emphasizing the South China Sea as a media space, this chapter only begins to outline the significance of digital media in shaping the geopolitical tensions and material transformations taking place in the disputed water. Thinking the ocean and the Internet relationally, I demonstrate an ongoing negotiation of political authority through infrastructures, signals, artificial islands and popular videos. Mobile Internet at sea is not only grounded physically on island, rocks, and reefs, but also reflects the broader history of oceanic governance that gravitates around land. Cellular signals, however, continue to produce new political borders at sea through its reception as well as popular imagination. Moving from the land to "looking from the ocean," I use this analytical shift to signpost the drastically changing media fields resulting from large scale land reclamation and

island construction. Central to this emerging digital-oceanic environment is an ongoing negotiation of political legitimacy for artificial islands as well as popular videos - both are framed as either "illegal" or "unauthoritative" by dominant discourses and forms of mediation. While the *Nanhai* video offers an example of how sovereign disputes over the islands enter everyday media production and populist engagement in China, the *Binh Minh 02* video showcases how amateur-style, cellphone video recordings actively intervene into public debates of oceanic rights and territorial disputes. Both case studies situate video's specific modes of mediation at the center of the "island fever," through which speculations arise and public discourses circulate. Video offers an intimate and speculative media encounter at sea, one that speaks to its turbulent political environment. Taken together, the South China Sea as a contested space of mediation points to the melting edges between political disputes and processes of mediation, between artificial entities and natural environments, and between material traces and speculations.

One of the possibilities this chapter points to is that studies of digital environments in Asia should no longer be enclosed by different versions of the wall: blockage, top-down control, and surveillance. The oceanic perspective, instead, gestures to this search for a more malleable contact zone of media and environment, creating different sites of political struggle and narration. In 2016, the art collective Field-recording presented a video installation "Let the Water Flow" at the Rockbund Art Museum in Shanghai. As a larger ethnographic project, the installation records people and lives that share a connection to the water of Shanghai's rivers, but that are nevertheless set apart from each other. The video installation waves together a fluid environment from the view of the river – one that continues to flow into different directions and allows these encounters through narration, memories, and simply everyday life routines. Rather than follow the water flow, as the installation proposes, the next chapter puts pressure on the techniques of capturing similarly afloat experiences and encounters through air. In doing so, my goal is to capture a geography of air that responds more aptly to the lives within these environments, and the changing geopolitical imaginary between Global North and South.

Chapter Three

Capturing an Atmospheric *South*: The Productive Materiality of Smog

"For many people in China, the most visible problem isn't the country's slowing economy, corruption or social harmony. It's dirty air….When its *thick blanket of smog* blows into urban areas, frantic citizens pick up their mobile phones to check air-quality levels….It's a reminder of the trade-offs at the heart of China's transition from a developing country into a prosperous, modern nation, forcing the Communist Party to balance the rush for economic growth against the threats to life and health."

--- Natasha Khan, "Choking China."[1]

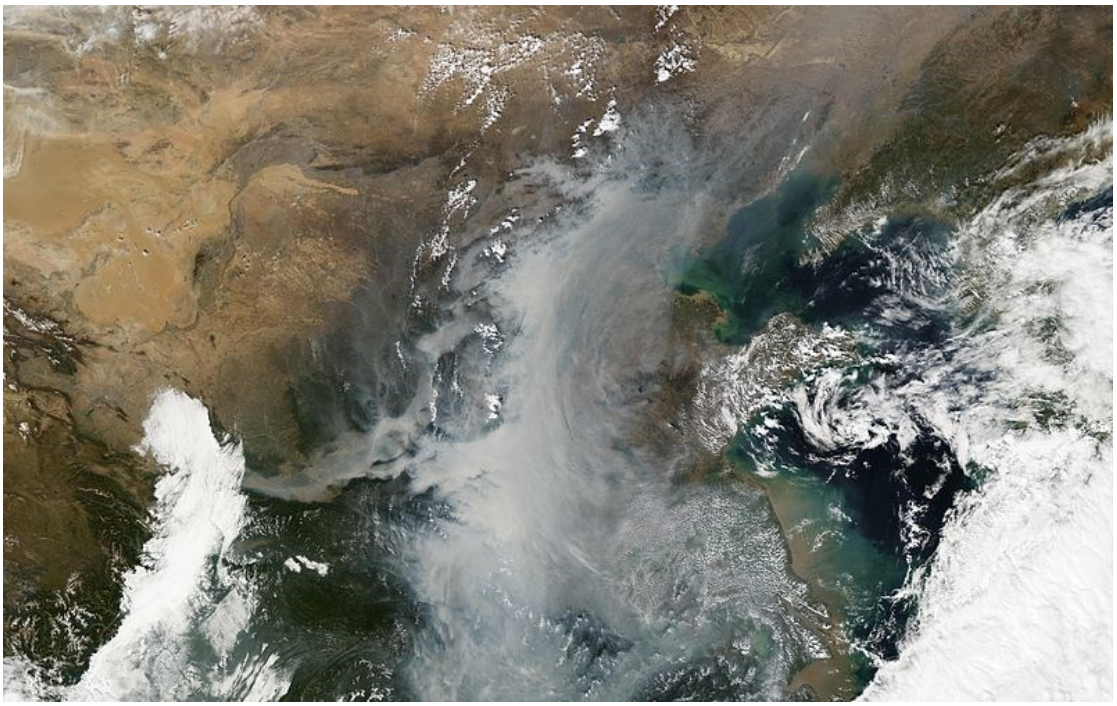

Figure 3.1 Color satellite image of a smog event in China, October 8, 2010. NASA Earth Observatory. Wiki Commons.

[1] "Choking China." *Bloomberg News*. May 13, 2015. https://www.bloomberg.com/quicktake/choking-china. Accessed May 13, 2017.

On 13 December 2004, the front cover of *Time Magazine* featured a photograph of Hong Kong island cloaked in haze, juxtaposed with the large front title – BAD AIR DAYS.[2] "Bad air," a term lacking scientific precision and political substance, was frequently used in popular media to describe the global concern of air pollution around the early 2000s. It was a convenient substitute for forms of unpleasant air – unpleasant effluvium, poisonous gas, miasma carrying diseases and epidemics, industrial emission, and smog. One might speculate that the non-specificity of "bad air" worked at the level of representation, that it excessively produced an imagery of polluted air and perpetuated a sense of environmental emergency.[3]

In the above example, nevertheless, "bad air" is not simply an inert object to be photographed, but rather animates an imagined geopolitical affinity between Hong Kong and Bombay (as suggested in the sub-title on the cover), despite the drastic differences in what causes air pollution and how it is experienced in each of these cities. Such affinity is pushed forward as a direct causal relation between rapid economic growth and severe levels of pollution, indicated by the photo caption. The narratives of air pollution as a result of, and a symptom for, developmentalism are similarly invoked in Natasha Khan's vivid description above. Only now, the "thick blanket of smog" not only moves across geographical boundaries, but also mobilizes people, technologies, and national politics in the developing south.

I want to linger on to this idea that (polluted) air *can* animate a certain geopolitical imagination and generate some forms of material traces - whether it is captured as a photograph or produces movements of people, government, and technology, present in the *Time* cover and Khan's description. This idea is the starting point for this chapter, and I hope to demonstrate that such animation of geopolitical relations becomes possible when we think closely of the "deep materiality" of air (Adey 2015), as meteorological phenomena, physical-chemical substances, and elemental affinities. Anthropologist Timothy Choy (2011, 145) further argues that "thinking about the

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[2] See the referred magazine cover from *Time Magazine* archive: http://content.time.com/time/covers/asia/0,16641,20041213,00.html. Accessed June 10, 2016.

[3] The World Health Organization (WHO) has claimed that 91% of the global population lives in places where air quality exceeds the WHO limit, and nearly 90% of air-pollution-related deaths happen in low- and middle-income countries. https://www.who.int/en/news-room/detail/27-09-2016-who-releases-country-estimates-on-air-pollution-exposure-and-health-impact

materiality of air and the densities of our many human entanglements in airy matters also means attending to the solidifying and melting edges between people, regions, and events." Following Adey and Choy's provocations, this chapter similarly takes air as a heuristic that encompasses various movements and experiences, trans-boundary relations, and a form of new attention to our changing ait conditions.

With this in mind, this chapter asks how (polluted) air's productive materiality (Coole and Frost 2010) can illuminate the intertwined nature of the Global North and the Global South, and may invoke the shifting form and experience of the South, one that is increasingly atmospheric. Specifically, I examine how (polluted) air moves and what these airy movements mobilize. I analyze different narratives and "captures" of the current air pollution crisis after the 2000s: data visualizations, art projects, political campaigns, bottled air, and migration. I argue that these variations of "atmospheric excursions"[4]—physical, imagined, digital, temporary or permanent—complicate a preconceived division of the world based on developmentalism. They carve out a geopolitical contour of what I call "an atmospheric South," in which the Global South "is everywhere, but always also somewhere: accountable, embodied, and highly heterogeneous" (Sparke 2017, 117).

Each section thereby examines one iteration of "the atmospheric South." The first part thinks of the southern experiences of air through intensity, both in the form of visualized data and through an embodied state of captivity. The second part argues that an atmospheric South is increasingly tied together through a political imperative of governing air and the redistribution of risk. In particular, I look at how China's "war on smog" mainly targets northern China as "non-productive," and in doing so redistributes polluted air and environmental risks to other parts of the nation. The third part examines how Peter Sloterdijk's "air conditioning" becomes a cultural technique of explicating and

[4] According to the Oxford English Dictionary, the term "excursion" is commonly used to describe 1) the action of running out, or escape from confinement; and 2) a journey or expedition away from one's home without the intention of returning. Figuratively, excursion can also depict an outburst of feeling, or overstepping the boundaries of propriety. Holding on to both its common and figurative usage, I use "atmospheric excursion" to invoke the unexpected trajectories that are full of sudden diversions, disruptions, and outbursts of various intensities and affect through the air. At the same time, it describes my bumpy journey of navigating through and interact with these phenomena and experiences.

partitioning the Southern atmospheres, in particular through the commercialized bottled air and emerging enclosure of air. I then conclude by thinking about air's transboundary nature – both as a fear of cross-border contamination, and an incentive for transpacific migration. These different practices of atmospheric mobility, as the chapter argues, constitute a *Southern* imagination and an experience of living intimately with air (pollution).

South **as Intensity**

Air has long been a crucial part of the human imagination and exploration, one that has always been entangled with our relation with technology and experiences of movement. Consider hot air balloon expeditions in the early 19th century, the invention of aircraft and popularization of air travel in the early 20th century, and the international race for satellite routes in the late 20th century. These historical examples constitute a perception of atmospheric space as both meteorological fields of movement and changing techno-political zones. However, to say that air more than ever enters our imagination and experience of the global in the 21st century, one must turn their attention to the complex techniques through which air is visualized, controlled, and experienced in unprecedented intensity. Global air environments are as much meteorological as social phenomena affected by thermal energy changes, territorial landscapes, human habitation, and political regulations. As a result, air constantly diverts its path according to its contexts, sometimes getting stuck in the valley, sometimes colliding, sometimes mobilized to serve a political agenda. These turbulent, trans-boundary, and unpredictable trajectories of air not only create diverse weather conditions but also designate zones of intensity and disruption, a crucial part that comprises the *southern* experiences of air.

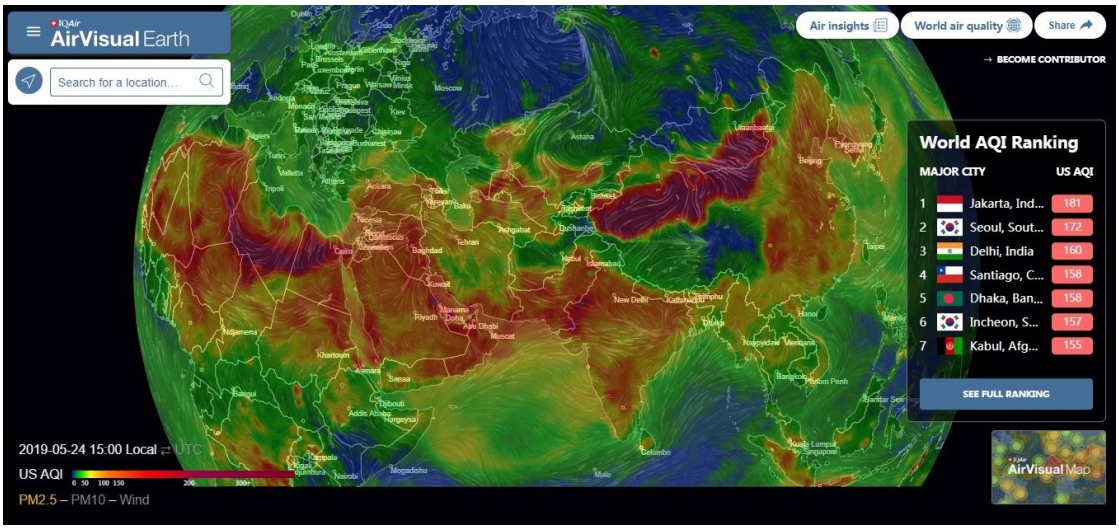

Figure 3.2. Screenshot from Airvisual Earth, image captured on May 23, 2019.

The recently launched AirVisual Earth offers one possible visual illustration of the complexities I outline above. Developed by a Swiss company, AirVisual Earth is the first interactive map to display live pollution data on a 3D globe's surface. Founded only in 2015, after four years of development, AirVisual has quickly become the most widely used international air pollution app, offering free access to "the world's largest air quality database" of over 10,000 locations.[5] This 3D pollution map, as described by the developers, "allows the viewer to see the shifting movements of PM2.5 pollution across countries and populations, and watch how this interacts with a hypnotic display of weather patterns" (Parkin, 2017).

Unlike other AQI visualizations and data maps, which mainly present accurate pollution indexes in a specific time and location, this 3D globe map offers a computer-simulated model of how air pollution moves and intensifies, how air interacts with other elemental variations, including wind patterns, shapes of the terrain, and temperature. As one spins the globe, zooms in and out of different regions, and waits for the live data to download, AirVisual Earth presents a "real-time" global geography of air based on the fluctuating PM 2.5 air particle concentration. To some degree, this model also recognizes discrepancies in different data sources. It draws from government-run environmental

[5] According to AirVisual's official website, they are also the first to offer a 7-day air pollution forecast, using machine learning and artificial intelligence. See https://www.airvisual.com/about-us. Accessed March 30, 2019.

databases, commercial satellite data, NGO monitoring data, and the company's built-in air quality monitoring apps and gadgets strongly encourage users to contribute their personal data. In sum, the computer model designed by AirVisual captures material movements of air (and its pollutants) through data, responding to variations in real-life factors and reliability of data sets. Eventually, it creates a simulated world where the Global South is marked by dark colors and high concentration rates, cuts across fixated geographical boundaries and folded in each continent.

What AirVisual also makes clear is that the imagined geopolitical South increasingly overlaps with, or is even dependent upon, the datafication of air pollution. Instead, the southern atmosphere is less a geographical marker but, rather emphasizes a new attention to intensity capturable by data systems, computer modeling, and visual forms. As Sarah Pink et al. (2014, 364) argue, the atmosphere often remains a field of "measurable degrees of intensity," displayed exclusively through quantifiable formats. These measurable forms of intensity are prioritized because they can be easily recognized and absorbed into pre-existing forms of information capture systems (Auge 1994), from environmental databases, social media algorithms, air quality apps, to digital sensors and processors. All of these systems are becoming part of our breathing environment (Gabrys 2016) as well as our geopolitical imaginary.

Nevertheless, AirVisual's 3D interactive pollution map still has its limitations. The digital simulated wind movements and color spectrums are indifferent to the political struggles and affective responses generated in these intensified atmospheres. In other words, these diagrams, charts, and interactive data maps rarely capture other kinds of intensity and tensions experienced on a daily basis—for instance, frustrations regarding nationwide flight delays, health anxieties, rising hospital visitors, political tensions between Pakistan and India in its Northern borders, and policy pressure to use clean but more costly energy for industry and households. As Jennifer Gabrys (2016, 158) discerns, even though various air quality apps and air quality monitors make data more accessible, "the pollution that individual experience in their everyday trajectories is quite different than the type of pollution that is captured through fixed monitoring sites generating data that are averaged over set monitoring periods." Therefore, one of the most urgent tasks is to narrate and account for different kinds of intensities and feelings that remain

unregistered on computational capture models, even though they push forward open-accessed pollution data. These other intensities, as I will elaborate later, reflect heterogeneous experiences of the Global South, living intimately with air pollution.

It is important to note that the notion of "capture" is not always associated with computation and datafication. Instead, "capture" designates a much more complex connotation across multiple fields of knowledge, which this chapter puts into use. According to the Oxford English Dictionary, the term "capture" surfaced in the English language as early as 1541 to refer to seizing or taking forcefully, usually for reasons of confinement or imprisonment.[6] By the beginning of the 20th century, the term's meaning evolved as it entered different disciplines. By 1901, "capture" was often used in the arts to mean "represent, catch, or record (something elusive, as a quality) in speech, writing" in a more or less permanent form. It is not until 1971 that "capture" becomes associated specifically with computation, signifying "the act of putting information in a form that computer can use or read." In this regard, capture accentuates practices of representation and preservation, a capacity often specific (and legible) to certain technologies and mediums. However, in the realm of modern Physics, to be "captured" is contingent on different physical and elemental forces, from erosive water movements, intra-planet gravitation, to magnetic forces among atomic particles.[7] Being "captured" in this sense means being lured by diversion, gravitation, and absorption—physical processes that promise neither total freedom nor control. Different from the previous reference to confinement (in its representational sense), "capture" could also motivate relations and constellations to *come into existence*.

This duel etymology of "capture"—as confinement/documentation within certain media/systems and as a process of being captivated by the material environment—offers a generative ground to investigate air's productive materiality (Coole and Frost 2010). The first sense helps to analyze practices of capturing air pollution as a visual object

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[6] The Etymology of "capture" is summarized from both paper and online version of the Oxford English dictionary. See: https://en.oxforddictionaries.com/definition/capture

[7] According to the OED, "capture" in the realm of physics refers to 1) "the process by which a stream by headwater erosion encroaches on the basin of a stream at a higher level, and diverts the upper waters of the latter into its own channel"; 2) "the process whereby a star or planet brings an object within its gravitational field"; or 3) "the process in which an atomic particle is absorbed by another particle, an atom, or a nucleus.

and/or quantifiable data. The second sense of "capture" then extends from the physical-material processes of coming into being to the generation of an elemental relation through a state of captivity.[8] Many critical theorists in the 20th century, who do not directly invoke the term "capture," can be seen as theorizing *a state of being captured*. In *War and Cinema: The Logistics of perception*, Paul Virilio (1989, 7-8) writes, "War can never break free from the magical spectacle because its very purpose is to produce that spectacle: to fell the enemy is not so much to capture as to 'captivate' him, to instill the fear of death before he actually dies." In Virilio's sense, capture operates in close connection to modern cinematic technologies (as systems of visual capture), but also it holds the capacity to generate *an affective state of captivation*: fear of one's future death. To be captivated, as Rey Chow (2012, 47) similarly puts it, "is to be captured by means other than the purely physical, with an effect that is lived and felt as embodied captivity."

This slow mutation between mechanical techniques of capture (through various mediums and technologies) and an embodied captivity that constitutes part of the material environment, speaks strongly to the turn towards air's materiality, particularly in disciplines like cultural geography (Jackson and Fannin 2011; Anderson and Wylie 2009). In human geography's "atmospheric turn," Peter Adey points out that although diverse approaches developed to address air's representational, political, and phenomenological attributes, they are often separated from each other. As he notes, "The phenomenological is often told apart from economic, legal and class struggles, so obviously imbibed by aesthetic sense and meaning. The technological apparatus fails to grasp the experiential lives of the population they are meant to inform. Meaningful representations of air are told apart from feeling and praxis" (Adey 2015, 59). Many recent works have started to channel these approaches, in particular through significant work to historicize elemental relations through air's scientific and affective contours in the case of hot air balloons (McCormack 2008) and the chemical affinity and geopolitics of the elemental (Adey 2015).

[8] Jeffrey Cohen (2014), for example, argues that "elemental relations" is a way to understand human / non-human entanglements and cohabitation. It resists a human-centric world view and instead sees the element offering "a human-scale entry into non-human relations." (55) Objects are no longer produced with predetermined human objectives but "interconnected in extensive and unexpected ways" in a non-teleological sense of "production" (54).

Adey's provocation of elemental geography is pertinent here in several ways. First, he takes the elemental as "a different kind or order of materiality" that is not reducible to recent writing on the theory of things, and instead, concerns "the closeness of matter, bodies and associations" (2015, 55). This particular elemental geography of air inherits the critical mandate in new materialism on affective relations and brings in an elemental model of capture - chemical affinity and political aggregation that do not always operate at the level of objects. Most importantly, air's affinities might "expound broader affinities of material, political and economic conditions of war making and visual representation" (70). It is upon this emerging elemental geography that air can take hold of a kind of geopolitics beyond the physical property of objects.

Certainly, this chapter does not offer to entirely construct an elemental geography of air. But Adey's thinking of air's elemental potentiality to expound on "affective and political affinities" pushes me to think across various locales, borders, and drastically different air experiences/encounters. Nut Brother's parody art project to make a "smog brick" elucidates the possibility to engage with various materiality of air in China's "airpocalypse." In 2015, the Shenzhen-based artist Nut Brother started the "dust project." Using an industrial vacuum machine, he collected large air particles and dust in Beijing and eventually turned them into a "smog brick" (Buckley and Wu 2015). For 100 days, he wandered around Beijing's streets with a vacuum for four hours, taking a different route each day (figure 3.3). This particular "airy" expedition was also facilitated with sets of media practices. Every day, he asked a stranger to take a picture of him, documenting him passing through any famous urban landmark. Later on, he updated the photographs to his social media accounts such as Weibo and WeChat. Eventually, the smog brick was produced through the collected dust, and recycled to rebuild a local courtyard house, becoming one in the thousands of identical bricks, constituting part of Beijing's urban environment.

Figure 3.3. Nut Brother holding a vacuum cleaner under the CCTV headquarters.[9]

This bizarre journey of Nut Brother first signals the broader energies invested to capture smog as visual objects and media events (Yang 2016a). These cultural energies often manifest through the production of media *about* the polluted air environment, in particular by featuring the daily experiences of living in smog through photography, documentaries, social media posts, or other art projects. For example, *Reuters* published a series of journalistic photographs titled "China's Airpocalypse" (Sagoli 2015), which depicted Beijing residents' daily activities during the smog red alert in November 2015.[10] In the photographs, we see young people running outdoors, groups of middle-aged women dancing in public squares, and people biking to work alongside heavy traffic, all of them resuming their everyday routines with air masks on. Nut Brother's photos in Beijing's smog also become part of this visual archive, highlighting the mundane practices of documenting the feelings and experiences of living intimately with air

[9] Image comes from the artist Nut Brother's Weibo account: https://www.weibo.com/jianguoxiongdi. Accessed June 10, 2016

[10] I have discussed one photograph (no. 21) in this series elsewhere, particularly in relation to mobile phone capture as a form of environmental participation. See the photo series at Reuters, https://www.reuters.com/news/picture/chinas-airpocalypse-idUSRTX1WIBW; and my article "Under the Dome: Un-Engineering Digital Capture in China's Smog." Asiascape: Digital Asia, 4, 13-32. 2017.

pollution.

The "dust project" further poses important questions about the material infrastructures through which these media *about* environments are circulated and consumed. In other words, it draws our attention to media *in* the environment that constitute the very fabric of the current state of air. During the course of Nut Brother's project, the artist often directly or indirectly interacted with everyday urban and media infrastructures—roads, transportation system, wireless networks, mobile signals, and environmental sensors – in order to keep the project going. His unexpected exchanges with strangers, interviewers, curious onlookers on the streets, and audience on social media network generated sets of social relations that are deeply embedded within particular media infrastructures - cell phones, cameras, social media apps, and personal contacts. Lastly, the artist's conscious mobilization of Beijing landmarks constitutes what Brian Larkin (2013) called "the poetics of infrastructure," through which such landmarks function as forms of infrastructure carrying aesthetic and symbolic meaning which can be translated across various spaces and audiences.

While previous analyses point out that both media *about* the environment and media *in* the environment (Walker and Starosielski 2015, 3) have become increasingly integral to the condition of atmosphere, the materiality of air—whether considered as resource, physical substance, or elemental relations—has not been accounted for in such cultural and political analyses. Central to Nut Brother's dust project is the physical and mechanical extraction of air—vacuuming dust and other filterable air particles through particular machinery. In this physical processing, air particles that are *disruptive* to metabolism are separated from the *productive* air, but these disposable parts of the atmosphere are re-engineered into a *material resource* for making the brick as well as a part of an artistic project. To put it differently, "waste" air particles are captured into other *cycles of production*: economic—as building materials for a Beijing local and historical architecture that holds commercial and social value; and cultural—as it becomes an artistic object but simultaneously the environment in which visual productions emerge.

Alongside this process of maneuvering air into different modes of production, the dust project itself also produces different affective experiences of *being captivated*. Nut

Brother has carefully designed the technology and routes to capture and materialize a selective body of air. But the physio-chemical nature of air changes over the course of 100 days, at different hours of the day, not to mention it constantly fluctuates due to the strong wind and extreme heat in the Beijing summer. The captor himself further becomes captivated in this urban, polluted atmospheric environment through the labor of dragging heavy machinery, like many others who live and work here also do. Arguably, we can see how air has produced an affinity between mechanical capture (vacuum machine, photographs, social media posts) and affective captivation (the laboring, the heat).

To conclude, Air Visual and "the dust project" present a glimpse into the southern experience that is increasingly visualized and experienced through various intensities of pollution: through computational models that captures the intensity of air pollutants and movements, or through intensified encounters with air's multiple kinds of materiality by wandering in the smog-ridden capital. Despite the various reasons that shape the dust project, the story of a Southern China-based artist wandering in the heavily polluted Northern capital also contributes to popular imaginary of "the polluted North" and "the clean South" in China. Southern provinces such as Yunnan and Guangdong are romanticized not only as the hope of China's environmental future but also as paradises with pockets of clean air (Liang 2013). These "southern imaginaries" of air have provided a new incentive for internal migration and tourism, which I will address in the last part of this chapter. For now, I want to revisit the notion that "China Smog" has been perpetually presented as a Northern issue, mostly concerning Beijing City and its nearby regions. In what follows, I examine how the "governing of air" becomes a political imperative in countries suffering from severe air pollution, in particular through China's "war on smog." But most importantly, this governance of and through air (pollution) is tactically targeting the North and subsequently redistributing environmental risks to other parts of the nation and the world.

"Combating" Air Pollution: Targeting the Non-productive North

In 2013, Chinese Prime Minister Li Keqiang publicly declared a nationwide "war on smog" (*xiang wumai xuan zhan*) in response to the severe air pollution. Li's provocation

is stated clearly: "We cannot wait for wind and rain. We need to fight [smog] actively."[11] Since then, the "war on smog," a purposefully militarized phrase, has constantly appeared in government documents and national news coverage. Albeit not an actual military action, this state-led campaign is often flagged as the Chinese government's dedication to and capability for tackling air pollution: by establishing government branches specialized in environmental issues (such as the Ministry of Environmental Protection), tightening air quality monitoring, building regional emergency protocols in severe smog weather, and implementing stronger policy regulation and law enforcement.[12] On the one hand, this is a reaction to the severe air pollution on the home front; on the other, it is also a response to international concerns on China's accountability in battling climate change at the global scale.

But what exactly does it mean to wage a war on smog—either as a meteorological phenomenon that can be modified, or as a "natural disaster" that requires a set of emergency protocols?[13] In Prime Minister Li's official statement, he further states, "When we say we need to wage a war on smog and other pollution, we don't mean to start a war with nature. What we mean is to *battle our primitive means of production and living*" (Li Keqiang, 2014).[14] By "primitive" (*cufang*), he is referring to the predominantly coal-driven industrial and economic production and the heavy carbon-consuming ways of living, both of which have been targeted as the main causes of air pollution. In this official iteration, smog and air pollution have been carefully "translated" into a political-economic substance. On the one hand, smog functions as the material marker that differentiates the primitive, "dirty" modes of production from "clean"

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[11] See report from *People's Daily*: http://lianghui.people.com.cn/2014npc/n/2014/0313/c382531-24626780.html

[12] The "PRC Law on Air Pollution Prevention and Control" released in 2015 is one of the prime results that consolidate diverse state response tactics into a legal framework so as to monitor and control the escalating smog weather. See its English translation by China's Clean Air Alliance here: http://www.cleanairchina.org/product/6882.html

[13] In 2016, after the 5-day Red Alert smog weather in Northern China, Beijing municipal authorities are preparing to officially list smog as a natural disaster. See report from https://chinadigitaltimes.net/2016/12/beijing-issues-pollution-red-alert-plans-list-smog-natural-disaster/

[14] This explanation comes from his Q&A session with journalists after the Twelfth National People's Congress. See report from *People's Daily:* http://lianghui.people.com.cn/2014npc/n/2014/0313/c382531-24626780.html

development, which has been driving the booming clean energy industry, and carbon-induced living; on the other hand, smog has blurred the distinction between political governance and management of "ways of living." Unlike Chai Jing's 2016 documentary *Under the Dome*, which pinpoints the issue of air pollution as a result of the corrupt energy industry and incompetent government institutions, China's "war on smog" becomes a lively demonstration of what Marjin Nieuwenhuis (2016) calls "the governing of air," in which "air pollution is framed not as an internal structural problem that needs to be solved politically but conceived as an external challenge to existing politics, legitimacy and social stability that needs to be targeted as part of social and productive life."

Building on Nieuwenhuis' argument, my intention here is not simply to provide more evidence that air has become "a site and a subject of governance." Instead, I want to further emphasize that, as these practices of governing air move across the country, as the smog disperses from Beijing City, they generate new centers of pollution due to an uneven enforcement of environmental policy and, most importantly, a redistribution of environmental risks based on a pursuit of economic productivity. This environmental warfare, I argue, targets most noticeably northern China, which economy is much more dependent on coal-driven industries than its Southern and Eastern neighbors. These "primitive" ways of production are further offset by the region's inability to sustain agricultural industries due to barren soil and insufficient rainfall. To put it differently, while smog has been established as the "national enemy," most significantly the war on smog is really combating a particular notion of "non-productivity" represented by China's Northern provinces.

To say that China's "war on smog" is essentially a northern project, one must connect it back to the longer history and practices of weather modification. Historically, one of the main purposes of weather modification in China is to gather and transfer resources from Southern and Southwestern China to fulfill the Northern demands.[15] For example, in 2017, the National Development and Reform Commission approved a 1.15

[15] See discussion of the history of weather modification in China since 1958, in particular the 12-year long cloud-seeding experiment in Fujian province.
http://www.cma.gov.cn/kppd/kppdqxsj/kppdrgyxtq/201212/t20121217_197687.html

billion Yuan rainmaking project for the dry northwestern provinces of Inner Mongolia, Qinghai, Ningxia, and Gansu (Ye 2017). According to an official from the "weather influencing office" (*rengong yingxiang tianqi bangongshi*) at Qinghai province, cloud seeding increased 55 billion cubic meters of artificial rainfall between 2006 and 2016. Most recently, a massive weather modification project was set on the Tibetan plateau. This project will build thousands of cloud seeding generators to generate snow and alleviate water shortages in the region, and ultimately transfer water to mitigate seasonal droughts in central and northern China (Chen 2016).

In contrast to these practices of weather modification, which aim to redistribute natural resources from the south to the north to increase productivity, the emerging practices to temporary suspend air pollution through emission control conversely distribute environmental risks. During important national events, these episodic, manufactured blue skies become one way to "see" how polluted air is manually relocated, how China's political intervention in environmental issues is as much about policy-making at national and regional levels as it is about the production of a "clean" image of a global China.

The 2008 Beijing Olympics was an earlier demonstration of how much of the current governance of air (pollution) targets the North as a "primitive" and unproductive terrain in need of intervention. Apart from the spectacular opening ceremony directed by Zhang Yimou, the 2008 Beijing Olympics also stunned the world with its crystal blue skies, despite prior international concerns about China's air pollution (Streets et al. 2007). In a press conference right before the opening, officials from the Ministry of Environmental Protection assured international athletes that precautions such as surgical masks "only adds weights to the luggage" and are also "only for those who know little about China" (Li et al. 2008). However, as multiple government reports and research later made clear, these blue skies were in fact centrally manufactured through strict controls over vehicle emissions, cross-provincial traffic, as well as intense monitoring over factories in and around the city of Beijing.

Even though emissions control is not a novel tactic for countries suffering from severe air pollution, the 2008 Olympic Games can be seen as the first governmental experiment in China to temporarily manage both *what* gets released into the atmosphere,

and also *where* and *how* they move. In other words, the Olympic Blue thus cannot be assessed as a singular incident but reflects a more general effort from the government to consolidate its success into an environmental routine with a set of administrative protocols. Similar strategies were repetitively used to create "APEC Blue" during the 2014 Asia-Pacific Economic Cooperation summit (figure 3.4), "Parade Blue" during the Grand Military Parade in 2015, and more recently "G20 Blue" during the G20 meeting in Hangzhou to discuss ending -subsidies for fossil fuel development.

Compared to the Olympic Games, during which emission control was mainly restricted to the city of Beijing, during the 2014 APEC Summit, the Chinese government implemented a stricter emission regulating protocols in Beijing and the nearby regions. The Minister of Environmental Protection revealed the details behind these clear skies. In order to create the "APEC blue," over 434,000 staff were organized by the central government of the Jin-Jin-Ji region (also known as the Beijing-Tianjin-Hebei capital region), Shanxi, Inner Mongolia, and Henan; thousands of industrial plants, construction sites, and petrol stations were suspended or forced to limit their operating hours; and 11.7 million vehicles were "ordered off" the roads (Lau 2014). The unprecedented scale and intensity of central orchestration behind APEC's blue skies was celebrated by the government as it drastically lowered the amount of PM 2.5 by 30 per cent during the Summit.

Figure 3.4. The blue sky during the 2014 APEC summit in Beijing. Photo source: China.org.cn

However, as the world leaders left Beijing, the smog swiftly returned to hazardous levels with cars returning to the streets and factories resuming productions. A series of recently published scientific studies on APEC blue similarly attest to the ephemeral relations between emission control and pollution reduction (Meng et al. 2015; Liu et al. 2016).[16] Witnessing the oscillating weather conditions, residents in Beijing and social media users quickly turned "APEC blue" into a sarcastic cultural and environmental buzzword of the year. Chinese social media platforms were flooded with hundreds of internet memes about "APEC blue," often describing a phenomenon that is "beautiful but ephemeral" (Larson 2014).

Unsurprisingly, these tactics have been criticized precisely for their ephemeral nature, only temporarily mitigating the severe air pollution rather than providing long-term solutions. However, what I want to emphasize here is how these sporadic, ephemeral blue skies are in fact closely tied to what Timothy Choy (2011) calls "air as index." Air quality quickly becomes not only a global index for comparing China to other countries but also a national index for intercity competitiveness in China and across Asia. On the one hand, other heavily polluted countries such as India and Poland take these manufactured blue skies as a visual proof of the Chinese government's iron fisted approach to pollution control, which has kept Chinese northern cities from the world's most polluted cities list.[17] On the other hand, after the "success" of APEC blue in regional emission control, governments at municipal and local levels similarly mobilized these protocols in hopes to reduce PM levels and achieve the goals set by the national "Atmospheric Pollution Prevention and Control Action Plan" (Chinese State Council 2013).[18] Predictably, the model of APEC blue—that is, regional-oriented environmental

[16] These scientific reports often use satellite remote sensing, mathematical models, and pollutant composition to assess how emission control actually affects "the chemical composition, sources, and formation mechanisms of fine particles" under variable meteorological conditions.
[17] See for example the World Economic Forum's report on the 10 most polluted cities in 2018 https://www.weforum.org/agenda/2018/05/these-are-the-worlds-most-polluted-cities. The list fluctuate and various depends on the sources of data (government or NGO).
[18] The Action Plan sets clear goals for national pollution levels and also assigns specific

protocols—has become the center for pollution control. Jing-Jin-Ji, the region most reported in China's smog crisis, was the first to put forward a regional response system in the nation. The Ministry of Environmental Protection for Beijing, Tianjin, and Hebei jointly published a series of emergency measures and later circulated the legislative document, "Jing-Jin-Ji Atmospheric Pollution Control Strengthened Measures (2016 – 2017)."

What is less discussed, however, is that these seemingly effective strategies to combat air pollution often have a direct impact on some of the poorest industrial regions in China, scattered across the Northeastern parts of China. There is a public outcry among citizens and on social media throughout Western and Central China, areas suffering from an escalating pollution level but equipped with less efficient systems of response. As one news article vividly describes, the Chinese government's crackdown on pollution is "choking" the output of chemicals, fuels, and other mineral materials, which are the major lifelines for provinces such as Shandong and Shanxi (*South China Morning Post* 2017). Therefore, while we increasingly see a clear priority in the Northern Jing-Jin-Ji region and the eastern provinces such as Shanghai and Hangzhou, who are busily implementing emergency protocols in pollution control, the polluted air is relocated with coal mining to central China (Guizhou, Ningxia provinces) and north to Inner Mongolia. Struggling for economic survival, the latter regions have opened themselves for much resource extraction, heavy industry and, certainly, polluted air. In short, China's emission controls might generate ephemeral blue skies for the capital, but it has long-lasting effects on the nation's air geography, by creating new pockets of pollution centers as well as poverty in Northern, Central and Western China.

The reflection on China's uneven pollution landscape also pushes us to re-evaluate the public call for open-access, transparent environmental data. Environmental information transparency has long been a focus in government research projects and official documents. In the case of air pollution, official research centers have actively promoted data transparency as an important resolution alongside incentives to encourage public participation. Since 2009, the Institute of Public & Environmental Affairs (IPE)

requirements to key city clusters – Beijing-Tianjin-Hebei (Jing-Jin-Ji region) in the North, the Pearl River deltas and the Yangtze deltas in the Southeast, both achieved by the end of 2017.

and the Natural Resources Defense Council (NRDC) have published annual Pollution Information Transparency Index (PITI) reports. This index assesses the level of pollution information disclosure across 120 cities in China, indicating the value of information transparency in environmental policymaking and public opinion. As their 2015 report stated:

> Information transparency on pollutants and pollutant sources is now seen as more than just a request from citizens to satisfy their right to know about pollutants and other environmental hazards. Instead, public information disclosure is increasingly valued by the government as a strategy to engage people of all backgrounds to actively participate in and collaboratively work towards pollution reduction. In short, pollution information disclosure is helping translate what were merely ideas on reducing pollution into discernible action.

The above statement not only acknowledges the acquisition and disclosure of public information as a state strategy for environmental protection but also frames information transparency as a strategy to encourage citizen participation, rather than essentially an issue of government accountability. Making pollution data open-access to the public has become a weapon to translate "mere ideas" to "discernible action."

However, in contrast to the data transparency discourse, air quality data published by government institutions has been questioned and criticized by residents and media alike. Many criticize the fact that these official data only focus on major cities and are only available through government agency websites. Further, even within the city of Beijing, specialists have pointed out that the accuracy of pollution data has been compromised by the fact that many air-monitoring stations are placed at less polluted suburbs, deliberately avoiding heavily populated areas (Cao 2016). In response to these skeptical voices, particularly after the 2008 Beijing Olympics, the U.S. embassy in Beijing and the U.S. Consulates in Guangzhou and Shanghai began to collect their own air quality data which they published hourly on Twitter. Chinese government officials soon demanded, in return, that foreign governments stop releasing data on China's air quality (Bradsher 2012). Various environmental NGOs also responded with grassroots campaigns and call for open environmental data. One of the most notable examples is the "I Monitor the Air for My Country" campaign, initiated by the Beijing Nature Quest

Agency in 2011. The initiative mobilizes volunteers to monitor PM2.5 levels and allows residents to borrow equipment to conduct their own measurements. The campaign eventually pressured the government to announce air quality information, in particular PM2.5 levels, daily and more accurately (Xu 2014).

These diverse and sometimes contested efforts from state, governmental and grassroots actors share an underlying goal in building an open and transparent network of environmental data, in hopes to address the geographical biases intrinsic to the policy-making process and enforcement I discussed earlier. However, media scholars caution against celebrating open-access data, in which conflating a wide range of digital engagements merely to "the realm of data mining and data governance" (Shah 2016). As a result, geographical and social biases are not only generated by political decisions but also a techno-determinism in the current environmental narratives afloat upon countries from the Global South.

I want to return to Chai Jing's controversial documentary on air pollution, *Under the Dome* (2015), which illustrates the dialectical relations between political strategies and data transparency. *Under the Dome* is, firstly, an intriguing media event that maps out the highly heterogeneous public opinions on air pollution in China. On February 28, 2015, the state newspaper, *People's Daily*, posted the documentary online, along with an exclusive interview with Chai Jing. Simultaneously, various online video platforms such as Youku and Tencent also broadcasted the documentary. Within 48 hours, it attracted over two billion hits and triggered heated debates on social media sites in China, generating millions of posts on Sina Weibo, Wechat and Zhihu. Apart from its popularity on social media platforms, the documentary also received endorsements from mainstream news media as well as government officials. Part of the initial attention from the public focused on the film's controversial topic and its ability to start a national conversation on one of the most pressing environmental issues in China. Audiences' enthusiasm quickly turned into online debates over the credibility of the data and evidence presented in the film. Some debated the scientific accuracy of the statistics; others questioned the accusations made towards to the stakeholders responsible for smog pollution. These debates were soon taken over by issues of censorship when the documentary was ordered

to be taken down only a few days after its initial broadcast. Since then, audiences can only access the full documentary on YouTube or through other unofficial channels.

The roller-coaster trajectory of the documentary—from being the poster child on mainstream media to being censored nationwide—points to its complex connection to political apparatuses. As a former investigative journalist from China Central Television (CCTV), Chai established her reputation most notably through her acclaimed investigation on air pollution in Shanxi, one of the most polluted provinces in China due to coal production and consumption. Even though *Under the Dome* was made after Chai left the state channel in early 2014, and it is branded an "independently" funded and produced documentary, a large part of her production team has a background working within state TV stations (Sohu News 2015), and she was able to mobilize resources, personnel, and connections across official and informal channels during production. Given the filmmaker's exclusive access to key figures from government divisions and the Chinese oil industry, as well as the initial endorsement by official newspapers and government officials, many questioned the extent to which the state was actually involved the film's production and promotion (Gardner 2015). In presenting these debates as requisite background, the purpose here is to reject any hasty labeling of the film as necessarily "anti-state" due to its censored status. Instead, I examine closely how the documentary structures China's air pollution issue through a narrative of "failure", which further leads to a celebration of digital, mobile phone capture as a form of environmental activism with the capacity to shape citizen practices.

Under the Dome presents an environmental issue of global concern—comparable to historical examples of heavily polluted cities such as London and Los Angeles—but specifically Chinese in its scale, form, and focus. This "global yet Chinese" framing of smog pollution is not simply a rhetorical question. Instead, it reflects the long-debated development discourse of "catching up" (Chattopadhyay 2000), through which environments become the cost of development, as discussed at the beginning of this chapter. In the film, this narrative manifests through a chain of institutional failures Chai encountered during her investigations: incompetent government departments that are unable to execute environmental standards and regulation, and ambiguous environmental laws and policies that are ineffective to tackle actual pollution cases. She bounced

through departments and officials, conducted interview after interview, but ultimately found herself frustrated at the corrupt state system.

Many of the accusations made in the documentary are not new to the debates of environmental protection in China. The ineffective governmental intervention has been carefully criticized by earlier scholarship and is regarded as an important incentive for the flourishing of non-governmental organizations in the 2000s (Yang 2005). However, the documentary is equally skeptical, or uncertain, about interventions coming from outside the state system. Apart from the failing official mechanism, non-government organizations and journalists also face growing challenges in intervening environmental issues, partially due to the systematic censorship of civil activism**.** At the end, she blames the slow progress tackling air pollution on the entangled network of stakeholders, mapping a highly corrupt energy system.

In the last 10 minutes of the documentary, Chai Jing shifts away from the bleak reality of environmental actions in China and turns to technologies as an effective solution. In the above screenshot, Chai introduces a recent mobile app to collect and update data of air pollution and contribute to a national monitoring network, urging audiences to "let the data be exposed under the Sun" (translated from the subtitle above). The mobile app featured here was developed by the Institute of Public & Environmental Affairs (IPE) but is part of a state-initiated project for open air pollution data. The app's promotional slogan —"discover pollutants around you"— indicates that the app is designed for the easy capture of environmental information and is fueled by the geo-locative function of mobile phones. The use of geo-location markers, therefore, becomes a crucial connection between randomized digital capture and environmental action. Chai continues to remark that a direct way to participate in environmental protection is to capture the source of air pollution anywhere and contribute to constructing a national air surveillance mobile network. In other words, mobile capture as a form of participation promises a kind of geo-specific immediacy in visual production (anytime and anywhere), whilst also suggesting that these generated visuals are not only unbiased but also all valid and legible to the digital network.

Figure 3.5. Screenshot from Under the Dome: Chai Jing presenting the state-initiated mobile app for monitoring national air pollution. The narrative (subtitle) reads: "let the data be exposed under the Sun."

In the documentary, mobile phone practices are celebrated as a democratic tool that can circumvent, if not entirely bypass, previous obstacles and issue of censorship. They constitute an alternative mode of participation through a somewhat abrupt opposition to the chain of failure in both state and civil infrastructures. Furthermore, the simple push of a button on one's phone allows one to perform and act as a citizen, a notion defined by the banality and possibility of cultural production and circulation rather than legal and political conditions (Pan 2017). Fan Yang (2016a, 238) argues that what the documentary proposes as citizen-initiated capture "privileges technological solutions and consumer agency" and also naturalizes "the tech savvy, consumer as smog-fighting agents." Echoing Yang's critique, these mobile phone practices are cut entirely from the larger digital environment marked by unequal access to mobile technologies, reliable data, in which subject formation happens largely outside of so-called citizen (data) participation.

In short, this section argues that China's "war on smog" targets a "primitive" mode of production and non-productivity that centers on its northern provinces. While the governments' efforts are often recognized by the international community as effective strategies that bring down the national's pollution level, this Northern project not only mobilized resources from southern provinces through weather modification but also

further redistributed environmental risks by relocating the mining industry and coal-intensive production plants to other parts of the country. These geopolitical dynamics, to some extent, reflect upon the enthusiasm towards open-access environmental data, which ironically reflects similar inherent biases in the technology and its public representation as well.

Air Conditioning: The Enclosure of Southern Atmospheres

While officials in Beijing consider classifying smog weather as "natural disasters" and are waging a war against it, entrepreneurs from Canada are busy bottling "100% pure Rocky Mountain air" and shipping them to countries like China and India. What started as a joke by two students from Alberta selling a Ziploc bag of air on eBay soon became a full-fledged process of measuring, containing, and distributing air from the Canadian mountains to the most polluted countries in the world. These geographically distant incidents map out two different approaches to air. As discussed in the previous section, China's "war on smog" understands air as increasingly "a site and subject of governance" (Nieuwenhuis 2016), unfolding through different techniques to target the non-productive North and to redistribute environmental risks. Bottled air however, apprehends air in terms of a vitality that can be manufactured, technologically enhanced, and recirculated globally.

In this section, I start by outlining the engineering of enclosed air space from scientific research to its current material and architectural form. Then, I examine how bottled air and its circulation has enclosed "an atmospheric South," perpetuating uneven modes of accessing clear air. Furthermore, the commercialized bottled air is emblematic of how closed-circuit, enclosed experiences of air are manufactured and designed for everyday life consumption. These enclosures of air as commercial products and architectures speak strongly to what Peter Sloterdijk (2009) calls "air conditioning." Specifically, I will analyze the ways companies, such as Vitality Air and Aethaer, use their promotional materials (websites, media reports, and videos) to market breathing air as a lifestyle and a kind of consumption. Following the bottled air to and India through its on-line reaction videos, I conclude with how atmospheric spaces are affectively enacted and performed.

The history of engineered "air envelopes" is not exclusively related to air pollution, but to a wide range of scientific and industrial developments. Synthetic atmospheric environments are designed and scientifically measured to regulate the process of production, preserve temperature-sensitive products, and to boost labor efficiency (Boer 2016, 82). The invention and popularization of air conditioning has historically shifted internal migration (from Northern to Southern U.S., and from suburban to urban centers). These practices of engineering interior climate-controlled chambers speak directly to Peter Sloterdijk's notion of "air conditioning" by "disconnecting a defined volume of space from the surrounding air" (2009, 20). Air conditioning, or the logic of engineering self-contained airspaces also continues to unfold materially, becoming a way to inhabit the Southern atmospheres. Martin Heidegger's term *Heimatlosigkeit*, or the absence of homeland, might be useful to understand the current ways of inhabiting our atmospheric spaces. Peter Sloterdijk argues that it would be inaccurate to assume Heidegger uses the term only to refer to a sense of homelessness generated by the movement and dislocation from rural to urban environments. Rather, Sloterdijk reinterprets "homelessness" as "a *denaturalization*, in the sense of the human being's banishment from its natural air-envelope and resettlement in climate-controlled spaces" (2008, 60). In other words, these artificially engineered "air envelopes" are the architectures that significantly differentiates atmosphere as a Southern experience, in comparison to air as the natural habitat of life.

Furthermore, the current air pollution sees a much more pervasive form of conditioning, as Jerry Zee (2014, 51) argues, "a boundary between interior and the exterior is becoming not only physically but also conceptually permeable, breached by particulate matter that sneaks through cracks and penetrates walls." He uses the example of Beijing as a city in a basin, surrounded by mountain ranges. On a windless day, the city's atmosphere becomes the great interior in itself, enclosing the air pollutants and its residents within.[19] In a more literal sense, air purifiers have moved from being indoor

[19] A different iteration of this disappearance of the interior could be seen in Timothy Choy's (2011) description of Hong Kong, where air pockets were not only locked in the lower part of the city center, but were built verticality on its mountainous terrain. This also reflects a division between the working class who remain in the crowded urban center with dirty air and the rich who can live up in the mountain with fresher air.

technologies to outdoor monuments. Facing the winter smog season, international schools in northern China have built air-filtered domes over the outdoor fields so that physical education classes can carry on in heavy smog (Shan 2017). In Xi'an city, Shanxi Province, one of the major coal production provinces in China, a 100-meter-high air purification tower was built in hopes of mitigating smog levels in the city. According to scientific tests by researchers at the Institute of Earth Environment at the Chinese Academy of Science, the smog-cleansing function can effectively cover an area around the tower of about 10 square kilometers, and the tower "has no peer in terms of size" (Chen 2018). This air purification tower is modeled on an earlier smog tower built by the Dutch architect Daan Roosegaarde in 2015. Started as a Kickstarter project, the Smog Free Tower would "travel to heavily polluted cities from Beijing to Paris, from Los Angeles to Mexico City," and most importantly, "harvest enough smog to produce over 3500 Smog Cubes per day," which would then be transformed into an exclusive piece of jewelry.[20] However, when it arrived in Beijing in the 798 Art District, discussions centered on the project as a public installation rather than as an effective curbing of air pollution.

In comparison with these architectural forms of air engineering, the emerging popularity of bottled air resonates with the logic of designing a sizable, controlled air space, but accentuates the possibility of transporting such experiences globally. In 2015, several entrepreneurs from Alberta created Vitality Air, a start-up company that collects, sells, and ships "100% pure Rocky Mountain air" to heavily polluted countries. As much as purchasing cans of fresh air might sound like a hoax to many, the idea of bottling and selling fresh air has been quickly picked up by entrepreneurs in Australia, New Zealand, the UK and the U.S. During an interview with CNN, the founders of Vitality Air, Moses Lam and Troy Paquette, talked about how their bottled air business started with a Ziploc bag of fresh air sold for 99 cents on eBay.[21] According to calculations done in December 2015, Vitality Air had sold the first shipment of 500 bottles in China within a week and a

[20] See the "Smog Free Tower" Kickstarter project page: https://www.kickstarter.com/projects/1777606920/the-smog-free-tower?ref=video

[21] The CNN interview was reboardcased in Katie Hunt's report on December 16, 2015, "Canadian start-up sells bottled air to China, says sales booming." https://www.cnn.com/2015/12/15/asia/china-canadian-company-selling-clean-air/index.html

half, and expected increased demands in the following months. Admitting that part of the initial consumption was more about novelty than functionality, Lam nevertheless repeatedly expressed optimism in the fresh-air market due to rising global concerns about air pollution. Paquette added to this confidence by outlining their market vision in China in the interview, "It [the bottled air] will be distributed globally. We want to put them in vending machines and in supermarket shelves in China."

Figure 3.6. Screenshot from CNN's interview with the two founders of Vitality Air. Troy Paquette (left) demonstrates how to use the bottled air.

Unlike the canned air in Mel Brooks's 1987 classic science-fiction *Spaceballs*, parodying a post-apocalyptic world, Paquette's vision for Vitality Air, seriously imagines a global market for bottled clean air. This evokes a familiar history of extraction and commercialization of natural resources, dating back to colonial times, and has been on the rise since the 1990s: from the drastically disappearing forests in Indonesia, mineral extraction across the Global South to the popularization of Fiji bottled water as a lifestyle. These historical and contemporary examples emphasize the significance of geopolitics when thinking about the global circulation of materials, a particular trajectory of "life support" from the Global South to northern industrial centers (Vora 2015), superimposed upon historical relation between colonizer/colonized, and the

economically-determined relation between the "developed" North and the "developing" South. But increasingly, we see that the capitalist extraction expands more evasively to new pockets of biological and technological sources—from tech-support labour to reproductive power, from lithium batteries to cooling systems for data centers. These new extraction at a global scale are on the rise and unsettle pre-existing notions of where resources and "lifeness" are extracted and where they serves. In other words, it is more and more difficult to distinguish where the South ends and where the North begins in this geography of *vitality*.

Figure 3.7. Vitality Air's bottled fresh air. Screenshot from the company's official webpage.

Bottled air has incorporated the geopolitical dynamic between North and South in a different way. On Vitality Air's official webpage, the two founders credit their own upbringing in the Rocky Mountains and their belief that "everyone should be entitled to fresh, clean air" for driving the company. Ironically, what the company philosophy describes is a growing division of life in terms of access to clean air. The company's motto, "Enhancing Vitality, One Breath at a Time," points sharply to this division, where a large part of the population can only access clean air sporadically and measurable (figure 3.7). Each of the Vitality bottles contains 7.7 liters of fresh mountain air (from

various locations) for $32 online, which comes with an attached breathing mask, promises "upwards of 150 inhalations." The company also actively branded the bottled air towards specific group of consumers who have higher health risks in severe pollution weather, for example, "Banff Air" for pregnant women, twin pack of "Lake Louise air" for children. High-stressed workers and outdoor enthusiasts are also the company's target consumer, who considered fresh air a lifestyle, posing pictures of breathing on Instagram and social media. These are only some examples to illustrate how commercialized air-in-a-bottle can "enact a primitive accumulation of air" (Zee 2014, 50), which not only invokes a new cycle of global exploitation of what Elias Canetti (1979, 13) calls "the last common property," but also promotes a specific life-style to live with air pollution: by importing and consuming fresh air and remaining active in everyday life. In this sense, bottled air positions the Global North—particularly countries like Canada and Australia—as sites from which "clean air" can be extracted, and then redistributed as merely another form of vitality that can be enhanced and controlled. In short, from the Vitality Air example, we can already see a gradual enclosure of atmospheres into pockets of freshness to breathe and be consumed by the Global South as a commercial product and a lifestyle of endurances.

The question now becomes: Whose lives are at stake? What other kinds of encounters with air and vitality are closed off? Vitality Air's official commercial, *Vitality Air, This is Your Life,* offer a glimpse into these questions. Simultaneously released on their company website and YouTube in 2015, this official video is more a visual illustration of our current condition of air than a promotion for a particular commercial product. For example, the video does not introduce the specificities of bottled air product, such as its bottle design, the production process, and channels of purchase, all of which have been the focus in multiple interviews with the founders of Vitality Air.[22] The actual product of bottled air only appears briefly towards the end of the video. Visually speaking, the commercial is not so much about providing realistic representations of the breathing environment we are living in. Most parts of the commercial are characterized by highly glossy, music-video-style visuals of beautiful natural landscapes, close-ups of

[22] For example, see interview https://nationalpost.com/news/canada/selling-bottled-lake-louise-air-started-as-a-joke-but-theres-actually-a-lot-of-demand

people breathing and living in their homes, accompanied by a soothing female voice-over. One can argue that it offers a poetic narration in which certain airy physical encounters are *animated* and *desired* – "turn your face to the wind," feeling the breeze "across your skin," listening to "the sound of breathing." The voice-over continues to closely associate breathing in the clean air with a sense of liveliness, whether in the natural or manufactured form, and suddenly states, "you know you are alive."

Figure 3.8. Screenshots from Vitality Air's commercial *Vitality Air, This is Your Life* (2015)

What has been portrayed here is two distinct modes of air experiences beyond Sloterdijk's ontological notion of "being-in-the-air". One comprises an immersive and continuous experience, engaging the entire body mechanism in the affective act of breathing. The other shows breathing as manufactured, technologically enhanced, only improvable "one breath at a time." The video's frequent cross-cuts between close-ups of bodily encounters and still shots of natural and urban landscapes further attest this point (figure 3.8). The seemingly random montage works to draw a parallel between breathing in the natural environment and air sold in bottles as if the two modes are indistinguishable.

Figure 3.9. Screenshot from Aethaer's Air Farming Video.

If Vitality Air envisions bottled air as a transnational industry of processing air and clean air as a life-style, the UK-based bottled air company Aethaer make this idea almost seem too ridiculous to be taken seriously. Founded in 2016, Aethaer started with a mission to raise awareness to global air pollution and committed to "protecting humans from the environment as well as protecting the environments from humans," according to its website. Aethaer's ambition falls short through its almost comical video "Air Farming," documenting how they obtain the jars of fresh air from the countryside in the UK.[23] The video begins from early morning, when the founder, Leo De Watts, puts a tray of empty glass jars in the car, preparing to "farm" some clean air. As they drive up to the mountain, his partner explains how they choose their air farming location by checking the wind patterns and temperature of the day. Then we cut to an unidentified mountain top, somewhere in the UK, and one "air farmer" are introducing the empty jars in front of the camera, whereas De Watts manically ran across with a butterfly net in hand, attempting to capture some air. The video continues with similarly absurd attempts of chasing the wind, and convincing us that in those supermarket glass jars, it contains the desperately needed fresh air, with an astonishing price tag of 80 pounds (about 100 USD) both online and in the streets of Hong Kong.

[23] Aethaer's Air Farming Video on its Youtube channel: https://www.youtube.com/watch?v=F9FefNGq1uA. Accessed June 10, 2016.

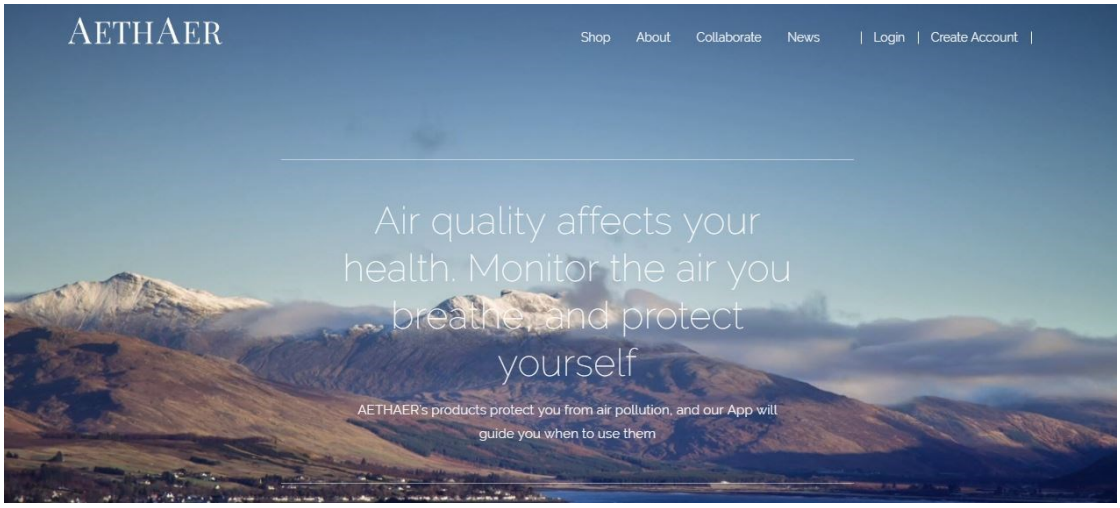

Figure 3.10. Snowy mountain landscape is the central imagination of an atmospheric North. Screenshot from Aethaer's official website http://www.aethaer.com.

Putting Vitality Air and Aethaer's example today, my intension is to emphasize that this global consumption of air as a product relies less in its reliability of the capture technologies themselves, as we see in both of their promotional videos. Rather, a geopolitical imaginary through the mountain ranges is decisive in pushing the circulation of this bottled air (figure 3.10). Across these bottled air businesses, what remains unchanged is the imagery of the snowy mountain landscapes, one that ironically becomes another symbol of a leisure, outdoor, and beautiful environment of the global North, when in fact, low basins among the mountain ranges are similarly suffer from air pollution.

As bottled air circulates globally, it maintains this geopolitical imaginary but is encountered more much affectively in the streets of polluted cities. The Gurgagon-based start-up Social Could Ventures launched #ChangeTheAir campaign in 2016 in India. With the development of the Hawa Badlo app, the campaign encourages collective efforts to improve air quality in the Delhi-NCR region and urges citizens to adopt environmentally friendly habits and to contribute user-generated air data through the platform. Naming the campaign with a hashtag further plugs it into a recognizable language that allows its mobilization across social media sites, a tactic commonly used by environmental activist projects. To kick off its campaign, Hawa Badlo released a video titled "The Air Seller," and continued to use short fictional videos as part of its campaign.

The video was first intended as a social experiment to test how people would react to the idea of buying clean air. As we follow the two vendors in suits selling bottles of Himalayan fresh air across the streets in Delhi-NCR, for 2000rps (about 30USD), the video captures outbursts of emotion from the curious passers-by, over their brief encounters with the bottled air. While many find the stunt funny, often expressing awkward laughter and comments of disbelief, most citizens responded mockingly to its ridiculous high price or simply the idea of paying for fresh air. One of the interviewed citizens is caught on camera lecturing the air sellers angrily, accusing the overall incompetence of the city to deal with the escalating air pollution.

Fig 3.11. Screenshot of Hawa Badlo's campaign video *The Air Seller* (2016). Residents in Delhi-NCR reacts to vendors selling fresh air on streets.

I am less invested in evaluating the success of the campaign, or how effective the app captured air quality data; rather, I want to understand this event as a particular atmospheric experience that could "have the capacity to generate and modulate affective relations across and between bodies" (McCormack 2014, 609). To do this, it is necessary to attend to the episodic narrative and affect generated in different short encounters with bottled air. As presented in this video, the movement of bottled air across these streets not only aggregates multiple bodies on site—interviewee, bystanders, people taking snapshots; but more importantly a temporary outburst of affective responses captured in

body language, emotionally expressed in conversations. Each encounter with the bottled air creates a narrative of the potential event, amplifying the curiosity, skepticism, and expectation from the participants. In other words, the excursion of bottled air, as both an on-site and mediated event, generates an array of affective responses, through which the public is animated not only by the physical gathering of bodies at the event, but also activated through precipitating rumors, speculations, and media coverages that persist long after the disappearance of the event. It is precisely this diffused field of expectations that can be activated through these circumstantial narratives, driving the movement of bodies in smog-stroked Delhi, and the very environmental campaign forward. In short, these temporary, site-specific encounters register the atmospheric spaces as both material and affective (McCormack, 2008, 414).

Conclusion: A Transboundary South

Up until this point, this chapter has navigated through various ways in which air moves, functions as captured intensities, is redistributed for productivity, and circulates as "air envelopes" of vitality. This last section proposes to focus on how air moves us, both as a concluding note for this dissertation, and as an incentive for future research that pushes a transboundary air further as a form of political alliance, a task that this chapter aspires to continue. In short, I hope to divert the analytical attention to what air pollution *does and produces* rather than framed as "the environmental cost of the China model of development" (Hilton 2013, 3). Smog is more than polluted particles awaiting to be captured, or simply an environmental problem that needs to be visualized and fixed. *Smog does things*. At the everyday level, smog has been reported to cause national flight delays, increase numbers of hospital visitors, and disrupt daily commutes and public events. Smog can also *bring up* rates of mortality due to diseases, *bring down* the stock market, and even *choke* the national economy. Other than being a disruptive aspect of economic, social and political life, what I argue throughout this chapter is how to think about (polluted) air's particular materiality (physical, chemical, and elemental) as productive, generating new movements, airy encounters, and media practices.

However, the dynamics outlined above also remind us of one thing: despite the fact that climate change is often discussed as a *global* environmental crisis that requires

international treaties and intergovernmental collaboration, air pollution is persistently depicted as site-specific events in catchy media headlines like “China Smog,” “India’s killer smog,” “New Mexico’s dirty skies,” even though it is no less transboundary than other forms of pollution. Fan Yang, for example, argues that the phrase “China’s smog,” often seen in popular media coverage, has ideologically concealed the transnational market’s role in this global environmental crisis. Take for example the transference of pollution-heavy, and energy-consuming industries from the Global North to countries in the Global South, or using the latter as dumping grounds for radioactive and poisonous waste and garbage. Instead, smog constantly moves across geographical borders, passing through humans’ respiratory systems (one of the main reasons that PM2.5 causes much highly premature death rates), and between different forms of mediations (data maps, photography, video, and air bottles). Therefore, air's transboundary nature, as understood in this chapter, refers not only to air’s ability to travel across existing spatial boundaries, but also (hints at) its potential to move across multiple registers and media: from chemicals to physio-material, from economic to political. These transboundary air movements further complicate the geopolitical relations they enact, gesture toward the formation of an atmospheric South.

Even through the term seems to indicate the dissolution of previous spatial boundaries, air particles as “transboundary pollutants” have been historically constructed across scientific practices, political negotiation and citizen participation since the Second World War. Rolf Lidskog and Goran Sundgvist (2011, 4) point out that, since the atomic bombing of Hiroshima and Nagasa, the fear of radioactivity has been “a key drive for understanding long-term transportation of pollutants.” This fear further pushes the development of meteorology and atmospheric chemistry as important post-war scientific disciplines, and also the foundation for international policy-making and regulation, such as the United Nation Convention on Long-Range Transboundary Air Pollution (CLRTAP). The co-production between the scientific knowledge of air’s materiality and policy making has been significantly driven by a form of affective atmosphere, in this case, the fear of chemical and radioactive contamination.

More recently, we have seen how both fear of contamination and nationalist sentiments have fuelled the anxiety of air pollution’s transboundary movements. Take for

example, the recent reported anxieties over smog's movement in East Asia, when experts from Japan and Korea expressed concerns that Northern China's hazardous air might be transported over to these countries, increasing their national pollution levels, health risks, thereby also affecting national politics (Ryall and Yoo 2013). In this scenario, smog is, on the one hand, site-specific—originating from Northern China, despite the fact that the rest of China is equally suffering from severe smog weather. On the other hand, smog is also transboundary—wind patterns can easily carry pollutants and dust across national borders. Japan's anxiety over cross-border contamination should be seen particularly as a combination of environmental security and nationalist sentiments. The Fukushima Daiichi nuclear disaster in 2011 heightened the regional concern over nuclear pollution and security, in particular through chemical and radioactive contamination in human bodies and fish stocks.[24] Nevertheless, China's anti-Japanese demonstrations in 2012 also created a crucial social context that bound spreading popular nationalist sentiments with atmospheric movements. South Korea, on the other hand, sees air pollution not as an internal issue but as an external threat "carried by the wind," subsequently playing a crucial role in its political election and social stability, a discourse similar to China's "war on smog" (Fifield and Seo 2017). Another example would be the hazardous smog weather in November 2017, which hit both India's capital Delhi and Pakistan's Lahore. While India targeted Pakistan's cross-border terrorism, Pakistan blamed India for the cross-border "incursion of smoke" due to crop burning in the border states of Punjab and Rajasthan (*Hindustan Times* 2017). In this example, the speculative movement of polluted air have come to occupy existing political divisions. Nosheen Abbas' (2017) offers hope that polluted air can bridge the historical and political divide between Pakistan and India. As both countries are heavily choked by smog, Abbas remarks, "Maybe the smog can bring us together." Ashok Swain (2017) similarly notes that air pollution might provide Pakistan and India, "a golden chance to 'clear the air' between neighbors."

[24] See reports on Fukushima radioactive contamination found in Alaska, https://www.reuters.com/article/us-alaska-fukushima/fukushima-contaminants-found-as-far-north-as-alaskas-bering-strait-idUSKCN1R90BV; and a Canadian NGO project to acquire data and access the Fukushima disaster's impact to Canada's Salmon, water, and soil. https://fukushimainform.ca/2018/03/11/monitoring-fukushima-contamination-in-pacific-salmon-and-soil-in-british-columbia/

In both cases, air pollution's transboundary movements throughout Asia often mobilizes a particular affective atmosphere, "involving ways of feeling in and as part of environments, experienced by the people who inhabit them" (Pink et al. 2015, 364). These airy movements enact not only existing political frictions but also an affective geopolitical relation carried by the wind and political anxieties. Certainly, saying that air pollution can actually "clear up" decades of political antagonisms might be seen as "wishful thinking" at best. But this also becomes a chance to ask what it means to "bring together" rather than "bring down," to think about smog not necessary as a disruptive force (indicated by in the need to "bring down," or "bring up"), but an opportunity to imagine new movements and affinities.

Thinking of the intertwined Global North and Global South thus also requires an attentiveness to the trans-national movements prompted by air (pollution) itself. In particular, air pollution has become one of the important incentives for internal and transnational migrations, both hinging upon an entangled imaginary of north and south through atmospheres. Facing chronic smog weather, China was recently abuzz with stories of escaping the smog. The most well-known story came from the well-known Chinese film director, Jia Zhangke. In December 2015, after a week-long red alert smog weather in the capital, Jia announced on Weibo that he decided to move away from Beijing because of the smog pollution, despite many years of active engagement in environmental debates, including the production of several short films on air pollution. He was certainly not alone in the rising voices of "moving away." Like many other middle-class families living in Northern China, Lan Yanfei, a working mother from Beijing, decided to quit her job and move to Li Jiang, a beautiful touristy city in Yunnan Province. When asked why she made this decision, she says, "My child is too young, I want him to live in a better environment" (*Chinanews* 2017).

Both Jia and Lan's story are only one slice of a broader phenomenon of environmental migration not only in China, but increasingly seen in countries that suffer from chronic air pollution. More importantly, this increasing form of pollution migration is less characterized by forced dislocation, as in the case of natural disasters, but rather a conscious choice and decision to look for better lives, and cleaner environments to live in. In this context, the term "smog refugee" quickly took over mainstream news media,

describing a proliferating population in motion triggered by global air pollution. A recent *Global Times*' headline compares "smog refugees" who can escape the smog with those who remain "stuck behind" and choked in the city. *South China Morning Post* reports how Beijing's smog refugees "flee the capital for cleaner air down south." Toxic air has driven Indians to flee the heavily polluted Delhi and immigrate to Canada for clean air (Keung 2016). Nevertheless, the term "smog refugees" seem to become a catch-all term for at-risk populations that are highly diversified in their geographical location, class, and the kinds of movement they participate in: from foreign expats living in Hong Kong returning to their home countries, middle-class families from Beijing going to nearby ski resorts for "lung vacations" to regular working class populations in Chongqing whose only option is to "wait for the wind" to clear the smog. These distinction of who can move and those who cannot but to live with and endure air pollution as part of everyday life is perhaps what most significantly marks my conceptualization of "an atmospheric south," one that is co-constituted with a divided geography of wealth, class, mobility, and now air, and this geography continues to traverse traditional boundaries of North and South.

CONCLUSION

In Julie Sze's *Fantasy Islands: Chinese Dreams and Ecological Fears in an Age of Climate Change*, she argues China's recent search for an ecological future is essentially driven by anxieties about "the changing global economic order and climate change," which has prompted strategies of managing the nation's problems of hyper-urbanization (2015, 6). Moving through discourses and architectures of sustainability in Shanghai and Chongming islands in the past decades, she then concludes that the ideological formation of the "environment" situates in specific places and simultaneously addresses the past, the present, and the future (159). Sze's insight into an epoch where ecological environments move from the background to the forefront of China's global aspiration is timely. This dissertation is reflective of this new attention to the political formation of "environments." Nevertheless, it insists that this intellectual task must be developed through a critical understanding of contemporary digital media, and opens up to less examined sites, stories, and routes of connections.

2019 is an interesting moment to reflect upon the co-constitutive relationships between digital media, environments, and geopolitics. One example that keeps grasping my attention as this project is concluding is the ongoing controversy over Huawei's global expansion of 5G wireless network, which the introduction has briefly set up. As a Shenzhen-based company, Huawei's rise in the global scene reminds us of a familiar success story of China's economic reform, in which Southern China became the poster child of a globalizing China first through electronic manufacturing in the 90s, then known as a hub for tech innovation in early 2000s, and to a leading network provider in the present. On the other hand, in mainstream news, this controversy is constantly framed under the Sino-US trade war. Under this cold-war narrative of bipolar power in the East and the West, it is easy to lose sight that the 5G race is also about access and control of infrastructure, about the ability to quantify and transform certain environments. In order to achieve the "networked dream world" (Mattern 2019) infrastructure and ownership are further concentrated in the hands of the few while risks are redistributed to new cluster of the South, with concrete social and environmental consequences.

Even though my project is not directly about 5G networks, the contexts I just described resonate with my research and writing in the past five years, and most importantly, they signpost the main conceptual question driving this dissertation: how would a southern framework change the way we understand the relationships between digital media, environments, and geopolitics, yet distinctively from the perspective of the People's Republic of China?

Therefore, this quest for Southern trajectory—both as theoretical and methodological endeavor—allows this dissertation to navigate through both familiar and isolated territories at various scales, across popular, institutional, and governmental discourses, and put these stories of our contemporary digital media in contact with the social and ecological environments from the perspective of People's Republic of China. While this may be a result of rethinking the dominant northern paradigm, over the course of these pages, "the South" points less to the lack of something or an uneven condition, but rather takes a distinctive form and relation to its environments and social contexts. Smart city takes on its own spatial and temporal characters on the southern lands, political authorities in the South China Sea rely on manipulating how the ocean is mediated and in what forms, living in the southern atmosphere means enduring risks and intensities but also generating new air conditions. In short, a focus on southern environments leads us to the specificities of how digital media is lived, experienced, and practiced.

A southern geography also reveals that the development of digital technologies has transformed built and natural environments into geopolitical contact zones. This process is achieved through practices of possession and dispossession, re-engineering and reconfiguration. This dissertation also contributes to the ongoing efforts to historicize the connection between media and environments in Asia and other non-West locations. This project outlines a set of historical processes that are inseparable to our current digital conditions but often remain unaccounted: whether it is China's history of urbanization, the post-colonial linkages in modern day maritime politics, or historical experiments of weather modification to increase agricultural production. Finally, this dissertation is about the materiality of digital media. This is not to suggest that the task is to go find the next cable landing sites or data centers, but rather to think of a more expanded notion of

materiality: from solid physical objects, to fluidity and the atmospheric, that is capable of addressing both human and non-human relations.

Positioned in these intellectual grounds, Chapter one examines how "smart city" becomes operational and actually produces within the context of the southern Chinese city Shenzhen. Bringing together policy documents, public exhibitions, concept videos, and everyday media practices, I argue that the spatial distribution of smartness not only relies on Shenzhen's post-reform land policy, but also works alongside technologies of dispossession—renewing urban villages, managing migrant labor, and distributing networks of surveillance. Furthermore, rather than projecting a unified vision for a "prototyped" future, smart urbanism in Shenzhen demonstrates a complex temporality across technological time, national time of development, and everyday time in urban life. If Chapter One is about how digital media "lands" on the ground, then Chapter Two started with a paradox, that land continues to dominate how digital connectivity is maintained and imagined in the ocean. Taking the sovereign disputes in the South China Sea as an example, I demonstrate that the shifting boundaries between land and sea have reconfigured what constitutes political authority and legitimacy in the disputed region, and how different modes of mediation (from maps, advertisements, satellite images, and online videos) comes into play in maritime politics. Lastly, Chapter Three pushes beyond the scope of immediate territories of land and sea, to investigate how (polluted) air moves and what these movements mobilize. I analyze different narratives and ways of "capturing" air pollution: from data visualizations, art projects, political campaigns, to bottle air and architecture. This chapter argues that by thinking closely at air's deep materiality - as meteorological phenomena, physical-chemical substances, and elemental affinities - helps to articulate the intertwined nature of the Global North and South in environmental crisis, and invoke the shifting geography the South, one that is increasingly atmospheric.

While this dissertation comes to a concluding note, in reality, the urban village that I discussed extensively is being torn down, migrant workers are being evicted, new islands are being built in the ocean and the coasts, and air pollutants are carried by the changing wind patterns to new urban clusters. The fluctuating nature of these environments reminds us that when digital media has become part of our land, sea, and air, they also

capture moments of encounters that would otherwise disappear in the next rising tide. The three chapter have hopefully offered an unfamiliar journey through spaces, communities, and practices that go in parallel with efforts to understand the digital present. And in doing so, it starts a much-needed discussion for future scholarship on the significance of understanding "the south" as transboundary in its exchanges, imaginaries, and politics.

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